

No. 11054

IN THE

# United States Circuit Court of Appeals

FOR THE NINTH CIRCUIT

---

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY,

Appellant,

vs.

NATURAL CARBONIC PRODUCTS, INC., a corporation, GEORGE PEPPERDINE FOUNDATION, a corporation, L. H. POLDERMAN, W. L. BENSON and C. B. BENSON, individually and as a copartnership doing business under the fictitious firm name and style of Natural Carbonic Products,

Appellees.

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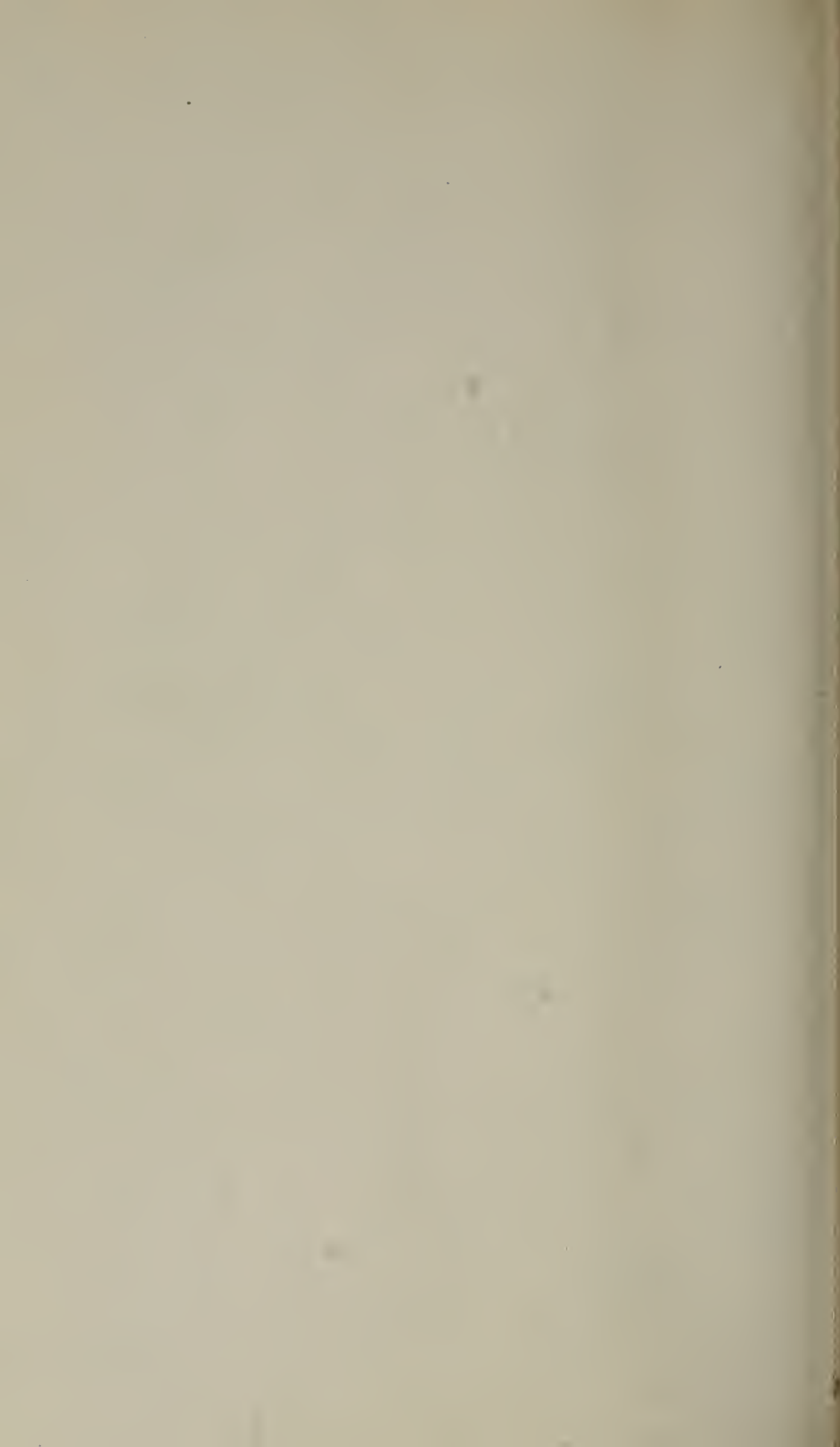
## TRANSCRIPT OF RECORD

VOLUME I

(Pages 1 to 422 Inclusive)

Upon Appeal from the District Court of the United States  
for the Southern District of California,  
Central Division

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## TRANSCRIPT OF RECORD

VOLUME I

(Pages 1 to 422 Inclusive)

Upon Appeal from the District Court of the United States  
for the Southern District of California,  
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HARRIS, KIECH, FOSTER & HARRIS,  
WARD D. FOSTER,  
471 Chamber of Commerce Bldg.,  
Los Angeles 15, Calif. [1\*]

---

\*Page number appearing at foot of Certified Transcript.

In Civil Action, File No. 1851-RJ  
In the United States District Court  
Southern District of California

Central Division

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY and INTERNATIONAL CARBONIC  
INC.,

Plaintiffs, ,

vs.

NATURAL CARBONIC PRODUCTS, INC.,

Defendant.

### PLAINTIFFS' BILL OF PARTICULARS

Now come the plaintiffs and in answer to specifications 1, 2 and 3 of defendant's Motion for a Bill of Particulars, and pursuant to the order of Court heretofore entered, file their Bill of Particulars as follows:

#### I

In response to specification 1, plaintiffs state that the acts of infringement complained of were and are being committed by the defendant at its plant near Niland, Imperial County, California. [6]

#### II

In response to specification 2, plaintiffs assert in this case that claims 4, 11, 14, 18, 28, 30, 31, 32, 33, 34, 35 and 36 of patent in suit No. 2,025,698 each define a combination of elements; that the particular combination of elements defined in each of said claims was a new and useful invention at the time of the invention thereof by Harry W. Cole and Malcolm W. McLaren, and that said

respective combination of elements rendered each of said claims patentable over the prior art; plaintiffs do not assert in this case that any element of any of said claims is in and of itself new and patentable apart from the combination defined in the claims.

### III

In response to specification 3, plaintiffs assert in this case that claims 38 and 39 of patent in suit No. 2,025,698 each define a combination of steps; that the particular combination of steps defined in each of said claims was a new and useful invention at the time of the invention thereof by Harry W. Cole and Malcolm W. McLaren and that said respective combination of steps rendered each of said claims patentable over the prior art; plaintiffs do not assert in this case that any step in either claim 38 or claim 39 of said patent in suit No. 2,025,698 is in and of itself new and patentable apart from the combination defined in the claims.

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY, INTERNATIONAL CARBONIC,  
INC.,

By LYON & LYON .

Their Attorneys.

LYON & LYON

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LEONARD S. LYON

R. E. CAUGHEY

HUGH L. MORRIS

Counsel.



[Title of District Court and Cause.]

ORDER TO INSPECT

The cause having come on to be heard on plaintiffs' application for an Order Fixing Time for Inspection and the Court having heard counsel for the parties:

It Is Hereby Ordered:

That the plaintiffs serve and file their Bill of Particulars as to Items 2 and 3 on Tuesday, January 20, 1942; that defendant permit plaintiffs, by Messrs. R. E. Caughey, A. E. Peck and H. W. Cole, to inspect the three presses employed in the defendant's plant near Niland, California, for the manufacture of solid carbon dioxide, and observe the operation thereof, on the morning of January 22, 1942; that plaintiffs, their attorneys and representatives, are enjoined from disclosing to others, or from [10] employing for any purpose other than the purpose of this case, any confidential information which they may acquire or observe during said inspection; that plaintiffs shall serve and file particulars requested in Item 4 of defendant's Motion for Particulars, as heretofore ordered by this Court, on or before February 5, 1942.

Dated: This 20 day of January, 1942.

RALPH E. JENNEY

Judge.

The foregoing Order is hereby approved:

LYON & LYON

R. E. CAUGHEY

HUGH MORRIS

Attorneys for Plaintiffs

C. A. MIKETTA

H. L. BURRELL

Attorneys for Defendant.

[Endorsed]: Filed Jan. 20, 1942. [11]



[Title of District Court and Cause.]

INTERROGATORIES PROPOUNDED BY PLAINTIFFS PURSUANT TO RULE 33 OF THE RULES OF CIVIL PROCEDURE, TO BE ANSWERED SEPARATELY AND FULLY IN WRITING UNDER OATH BY ANY OFFICER OF DEFENDANT CORPORATION COMPETENT TO TESTIFY IN ITS BEHALF.

(1) Was defendant using at its plant near Niland, Imperial County, State of California, at the time the complaint herein was filed, the three presses in which carbon dioxide snow is compressed into blocks, referred to in Paragraph VI of defendant's answer?

(2) If the answer to Interrogatory (1) is in the affirmative, was each of the said three presses then being used?

(3) For what length of time immediately prior to the time of the filing of the complaint herein, had each of the said three presses been used by defendant at its plant near Niland, Imperial County, State of California, or elsewhere? [23]

(4) When did defendant begin the use of each of said three presses at its plant near Niland, Imperial County, State of California, or elsewhere?

(5) Has defendant used said three presses or any thereof since the filing of the complaint herein?

(6) If defendant has used, since the filing of the complaint herein, less than all of said presses, state which presses have been so used and the time or times of the use of each.

(7) Which of said three presses has a compressing chamber?

(8) Is solid carbon dioxide produced by defendant, formed in each of said chambers?

(9) Which of said compressing chambers is openable at one end to permit the removal or ejection of the carbon dioxide solidified and compressed therein?

(10) Which of said chambers has connected therewith means for closing it or them at its open end, during the solidification therein of the carbon dioxide?

(11) Which of said chambers has connected therewith means for closing said chamber at its open end during the compressing operation?

(12) Which of said chambers has connected therewith means for moving the closing means, after the compressing operation, for removal of the compressed or compacted carbon dioxide?

(13) In which of said chambers is the compressing means adapted to eject the compressed carbon dioxide after the carbon dioxide therein has been compressed or compacted?

(14) Which of said chambers has connected or associated therewith, means or apparatus for supplying thereto liquified carbon dioxide for expansion to produce in the chamber an accumulation of solidified carbon dioxide? [24]

(15) In which of said chambers is the carbon dioxide compressed, against a movable head of the chamber, by a ram or plunger?

(16) With respect to which of said chambers is the means for opening and closing the movable head of the chamber hydraulically operated?

(17) With respect to which of said chambers is the ram or plunger for compressing the solidified gas hydraulically operated?

(18) Which of said chambers has connected or associated therewith apparatus or means for controlling the gas pressure in said chamber?

(19) Describe, and illustrate by a drawing or drawings, the means or apparatus for controlling the gas pressure in said chamber and the relationship, connection, or association of such apparatus with said chamber.

(20) What pressure is maintained by defendant in each of said chambers,

(a) during the time that liquified carbon dioxide is being supplied to the said chambers, and

(b) during the period, if any, intervening between the time the supply of liquified carbon dioxide to the chamber is shut off and the completion of the solidification of the carbon dioxide?

(21) Is all of the liquified carbon dioxide supplied to the chamber of any of said presses converted therein into a solid? Or is part of the liquified gas supplied to the chamber in each of said presses converted into a solid and the remaining portion of the liquified gas converted into gaseous form?

(22) Which of said chambers has connected thereto or associated therewith a conduit or pipe, or conduits or pipes, through which the portion of the liquified gas supplied to the chamber that is therein converted into a gas, passes from said chamber? [25]

(23) Which of said chambers, during the period that it is being supplied with liquified carbon dioxide and during the period of solidification, is substantially closed to atmosphere?

(24) In which of said chambers is the plunger or ram movable to press an accumulated mass of solidified gas into a block?

(25) Which of said chambers is substantially closed to the atmosphere during the pressing stroke of the ram or plunger?

(26) With respect to which of the said chambers is the movable head or closure member thereof in its completely closed position prior to the completion of the pressing stroke of the ram or plunger?

(27) In which of said chambers is said plunger normally inactive during expansion of the liquified gas and the accumulation of the solidified gas in the chamber?

(28) Which of said chambers has connected or associated therewith means or apparatus for maintaining the movable head or closure member in chamber-sealing position, against opening under the action of pressures within the chamber?

(29) In which of said chambers is there a pressing plunger, reciprocal therein, for pressing solidified carbon dioxide in the chamber into a block against the movable or closure head, while said movable head is held in chamber-closing position?

(30) In which of said chambers is the plunger so formed as to permit passage of gas therepast, while the plunger is being moved in the chamber?

(31) Which of said chambers is, during operation, vertically disposed?

(32) Which of said chambers has a closed top?

(33) Which of said chambers has a vertically disposed fluid pressure cylinder below it? [26]

(34) Which of said cylinders has a vertically reciprocal plunger therein?

(35) Which of said cylinders has a chamber-closing head mounted on the end of such pressure cylinder and

vertically movable therewith between position closing an end of the chamber and a position opening an end of the chamber?

(36) Which of said chambers has a pressing plunger vertically reciprocal therein for pressing a mass of solid carbon dioxide in the chamber into a block against the chamber-closing head when the head is in chamber-closing position?

(37) In which of said chambers is there a pressing plunger movable toward and from the closing head and in normally inactive position located in the chamber spaced from the closing head?

(38) Which of said chambers has a means connected or associated therewith for supplying liquified carbon dioxide to the chamber with the closing head in closed position and the pressing plunger in inactive position spaced from the closing head?

(39) Which of said chambers has associated therewith a closing head movable from chamber-closing position to a position spaced from the chamber, for unobstructed removal of a block of solid carbon dioxide from the chamber?

(40) Point out on a diagrammatic drawing for each type of the three presses used by defendant, the several parts thereof hereinbefore inquired about, designating them on such drawing or drawings by letters or numerals and explanatory statements for each such letter or numeral, and also indicating thereon by arrows the course or pathway of the carbon dioxide from its introduction into such mechanism in the form of gas to and including its extrusion therefrom in the form of a solid block.

(41) Which of the many patents pleaded by reference in Paragraph X of defendant's answer heretofore filed,



will defendant [27] rely upon at the trial of this action (a) as anticipations and (b) as showing the state of the art?

(42) In what respects does each of the patents pleaded by reference in Paragraph X of defendant's answer that defendant will rely upon at the trial of this action, either as anticipations or as showing the state of the art, disclose the combination of elements, steps, or processes set forth in Claims 4, 11, 14, 18, 28, 30, 31, 32, 33, 34, 35, 36, 38 and 39 or any thereof of United States Letters Patent No. 2,025,698?

(43) In what respects does the publication referred to in Paragraph X of defendant's answer disclose the combination of elements, steps or processes called for in each of the Claims 4, 11, 14, 18, 28, 30, 31, 32, 33, 34, 35, 36, 38 and 39 or any thereof of United States Letters Patent No. 2,025,698?

(44) When, where, and for what period or periods of time was the alleged invention described or claimed in each of the Letters Patent pleaded by reference in Paragraph X of defendant's answer heretofore filed, publicly used as alleged by defendant in Paragraph X of its answer?

(45) When and for what period or periods of time was each of the structures and processes alleged in Paragraph X of defendant's answer to have been publicly used by Norman M. Small, Frank R. Zumbro, Raymond C. Pierce and Malcolm W. McLaren, so publicly used?

(46) In what respects did each of the devices or processes referred to in the preceding Interrogatory have, contain, or include the combination of elements, steps or processes called for by Claims 4, 11, 14, 18, 28, 30, 31, 32, 33, 34, 35, 36, 38 and 39 and each thereof of United States Letter Patent No. 2,025,698?

(47) What was the structure, functioning, mode of operation, the time and temperature range or ranges employed or used in each of the machines referred to in Interrogatory 45 hereof, [28] at each stage of the progress of the carbon dioxide therethrough, together with the state of the carbon dioxide when introduced into said device or machine, how it was introduced thereinto, and the state or condition thereof when removed therefrom, setting forth, as well, the points in the progress of the carbon dioxide through the machine at which carbon dioxide in liquid form was converted (a) into snow and (b) into a compressed block of ice?

(48) Illustrate by drawings each of the machines or devices referred to in Interrogatory 45 hereof, in such detail and character as will disclose fully both the internal and the external structure of said machines or devices.

The defendant, by an officer thereof competent to testify in its behalf, shall answer separately and fully each of the foregoing Interrogatories under oath as provided for in Rule 33 of the Rules of Civil Procedure.

Dated: This 17th day of August, 1942.

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY and INTERNATIONAL CAR-  
BONIC, INC.

By HUGH M. MORRIS  
LEONARD S. LYON  
LYON & LYON  
REGINALD E. CAUGHEY  
Their Attorneys

[Endorsed]: Filed Aug. 18, 1942. [29]

[Title of District Court and Cause.]

DEFENDANT'S ANSWERS TO PLAINTIFFS'  
INTERROGATORIES

L. H. Polderman, an officer of the defendant corporation, answers plaintiffs' interrogatories as follows:

1. In answer to Interrogatory 1, plaintiffs are advised that three presses for compressing snow into blocks were owned by defendant at the time the complaint herein was filed, that is, on October 21, 1941.

2. On October 21, 1941, the H.P.M. press was being used in the performance of its inherent function. The two Frick presses were not in operation.

3. The two Frick presses were originally purchased in 1934 by Carl M. Einhart and used by Pacific-Imperial Dri-Ice, Inc., [30] later known as Pacific Imperial Dry Ice Company. These were used in the performance of their inherent functions, that is, the pressing together of carbon dioxide snow into blocks, intermittently during the period 1934 to prior to filing of the complaint. The H.P.M. press was purchased in December, 1940 and installed in February or March, 1941. This press has been intermittently used in compressing carbon dioxide snow into blocks from about March, 1941 to immediately prior to the filing of the complaint.

4. See answer to Interrogatory 3.

7-40. In response to Interrogatories 7 to 40, affiant attaches hereto Exhibits 9 and 10. Certain of the interrogatories are amplified hereafter.

With respect to Interrogatories 18 and 19, defendant can not truthfully answer these interrogatories since the scope or meaning of "controlling the gas pressure" is not



known. Defendant states that a plug cock or valve is in the so-called blow-back line leading from the press to the compressor, but this is not set to give a definite, predetermined or controlled pressure in the press nor in the blow-back line and that the pressure in the press and blow-back line varies from atmospheric or 0 pounds gage to about 80 pounds gage pressure.

With respect to Interrogatory 20b, defendant states that this interrogatory can not be fully answered because it is ambiguous and unintelligible.

With respect to Interrogatory 30, defendant states that to the best of its knowledge and information leakage occurs past the upper plunger or platen in each of the presses.

With respect to Interrogatory 40, defendant states that said interrogatory is confusing and unintelligible because it refers to the introduction of carbon dioxide into the mechanism "in the form of a gas". In defendant's presses liquid carbon dioxide is supplied and such liquid upon expansion is converted [31] in part into solid carbon dioxide in the manner characteristic of the physical properties of carbon dioxide and well known since about 1860.

41. Answering Interrogatory 41, defendant states that each of the patents now listed in Paragraph X of the answer heretofore filed—

(a) will be relied upon during trial as an anticipation of one or more elements, means or steps of the purported invention of the patent in suit;

(a) will be relied upon as showing the state of the art and that patent No. 2,025,698 lacks invention thereover.

44. Defendant states in answer to Interrogatory 44 that effort is being made to ascertain the precise dates and periods of time requested in this interrogatory and that such information will be transmitted to plaintiffs as soon as it is obtained, but at present it is not known to defendant.

45. Defendant states in answer to Interrogatory 45 that effort is being made to ascertain the precise dates and periods of time requested in this interrogatory and that such information will be transmitted to plaintiffs as soon as it is obtained, but at present it is not known to defendant.

47. Defendant states in response to Interrogatory 47 that to the best of its present information each of the machines and processes used by Norman M. Small, Frank R. Zumbro, Raymond C. Pierce and Malcolm W. McLaren included a chamber into which liquid carbon dioxide was supplied; a part of the liquid so supplied expanded into a gas while another was converted into solid particles of carbon dioxide; that the gas was returned for use in the system while the solid particles were compressed into blocks; that each of the machines included a chamber and platens or pressure heads, as is the case in any press designed to compress material into blocks, and that the structures and steps employed were those [32] available in and known by the art.

L. H. POLDERMAN

[Verified.]

[Endorsed]: Filed Oct. 20, 1942. [33]

[Title of District Court and Cause.]

DEFENDANT'S ADDITIONAL AND AMPLIFIED  
ANSWER TO PLAINTIFFS' INTERROGA-  
TORIES

L. H. Polderman, an officer of the defendant corporation, amplifies the answers heretofore filed to plaintiffs' interrogatories, as follows:

5. The answer to plaintiffs' Interrogatory 5 is "yes".

6. In answer to plaintiffs' Interrogatory 6, defendant states that three presses have been used intermittently and at various times.

L. H. Polderman further states that the statements, made in Defendants' Answers to Plaintiffs' Interrogatories, which answers were sworn to by him on October 19, 1942 and filed October 20, 1942, were the best answers that L. H. Polderman could make of matters within his personal knowledge, and that [34] there is no officer of defendant corporation having a better personal knowledge of the matters inquired into.

L. H. POLDERMAN

[Verified.]

[Endorsed]: Filed Mar. 25, 1943. [35]

[Title of District Court and Cause.]

FURTHER ANSWERS TO PLAINTIFFS'  
INTERROGATORIES

L. H. Polderman, an officer of the defendant corporation, further answers the interrogatories heretofore filed by plaintiffs, as follows:

1. Prior to the filing of the complaint herein defendant had used the three presses referred to in Paragraph VI of defendant's answer; but at the time the complaint was filed defendant was not using the two Frick presses.

2. If by "then" plaintiffs refer to the time the complaint was filed, i. e., October 21, 1941, then the answer is in the negative.

3. Prior to the time of the filing of the complaint, defendant had used, at its plant near Niland, each of the three presses. The presses were not used continuously. The question is ambiguous as to what is meant by "length of time immediately prior to the time of filing" and defendant can not answer this except as formerly answered. [36]

4. Defendant first used the H.P.M. press at its plant near Niland on about March 1941. To the best of its knowledge and belief, the two Frick presses were first used at Niland in 1934 and by this defendant in February or March 1940.

9. Each of the presses includes a wall forming a cylinder or chamber in which carbon dioxide snow is collected and compressed into a block; it is assumed that the interrogatories refer to this wall forming the cylinder as "compressing chamber". In the light of such definition, the answer to Interrogatory 9 is,—all of them.

10. None of the chambers, as defined above, has connected therewith means for closing them.

11. None of the chambers, as defined in answer to Interrogatory 9 herein, has connected therewith means for closing them.

12. None of the chambers, as defined in answer to Interrogatory 9 herein, has connected therewith means for moving a closing means.

13. To the best of our knowledge and understanding of this interrogatory,—all of them.

14. This interrogatory, as revised by the Court, reads: "Into which of said chambers may liquefied carbon dioxide be injected?". The answer is,—all of them.

15. All of them.

16. If the term "hydraulic" refers to both water and oil, the answer is,—all of them.

17. All of them.

18 and 19. Defendant can not truthfully answer these interrogatories as phrased since the meaning and scope of the term "controlling the gas pressure in said chamber" is not understood and no particular stage of the operations is referred to. Defendant states that no automatic means are employed for [37] maintaining any predetermined pressure in the chambers, as stated in defendant's Exhibits 9 and 10. There is a blowback line connected to each chamber and a manually operated valve in each blowback line, as shown by defendant's Exhibits 9 and 10, such blowback lines running back to a compressor. Upper and lower platens or rams assist in closing the ends of the chambers and thereby cause pressure to build up in the space enclosed by the chambers when



liquid CO<sub>2</sub> is admitted into each chamber. Lower platen of H.P.M. press is slightly lowered at end of snow forming to let out some additional gas and is kept in such slightly lowered position during pressing. Upper ram of Frick presses is slightly raised to let out some additional gas and kept in such slightly raised position while pressing upwardly with lower ram.

20. No predetermined pressure schedule is maintained by defendant and pressures vary with operator on the job, temperatures of air, whether presses have been working immediately prior or not, etc.

(a)—To the best of our knowledge, pressure in each chamber rises from 0 pounds gauge to between 62 to 72 pounds gauge (occasionally going to 80 pounds gauge) during the time that liquid carbon dioxide is being admitted into chambers.

(b)—Defendant does not understand this interrogatory but volunteers the following: After the valve admitting liquid carbon dioxide is shut off manually, the pressure in the chamber starts dropping and when pressure is down to between 10 pounds and 25 pounds gauge, the blowback line is manually opened to the atmosphere (instead of to the compressor) to permit the remaining gas in chambers to blow off to the atmosphere. Platens and rams are then manually operated as [38] stated in answer to Interrogatory 19. Defendant does not know what pressure exists in the snow while it is being compressed into a block.

21. The answer to the first part of this interrogatory is in the negative; to the second part, in the affirmative.

22. All of them.

23. All of the chambers permit gas to escape therefrom during this period.

24. All of them.

25. None of them.

26. None of them.

27. All of them.

28. All of the chambers have a ram or platen associated therewith which will resist opening under the action of pressure within the chamber.

29. None of them. Defendant does not operate in this manner.

30. Defendant states that gas escapes from each chamber while a plunger or ram is moved to compress snow into a block.

31. All of them.

32. All chambers can be closed or opened at the top.

33. All of them.

34. All of them.

35. All of them.

36. None of them.

37. This interrogatory is ambiguous. Defendant, interpreting this interrogatory very broadly, states, in answer thereto,—all of them.

38. All of them.

39. All of them. [39]

47. In response to Interrogatory 47, defendant states that to the best of its present information each of the machines used by Norman M. Small, Frank R. Zumbro, Raymond C. Pierce and Malcolm W. McLaren included a chamber provided with pipe means for supplying liquid



carbon dioxide to such chamber, means for opening one end of each of the chambers, a pipe means for permitting discharge of unsolodified gases from the chamber, and a movable element extending into each chamber for compacting the snow into a block. A manually operated valve was included in the pipe leading from the chamber and through which uncondensed gases could be discharged. In the processes used by said Small, Zumbro, Pierce and McLaren the carbon dioxide was in liquid condition at the time of its introduction into the chamber. The temperature of the carbon dioxide immediately prior to its introduction into the chamber is not known to this defendant. To the best of defendant's present information, after the liquid carbon dioxide was introduced into the chamber, a part of it was converted into a snow due to the rapid expansion and vaporization of the liquid, and a part of such carbon dioxide remained in the form of a gas. Carbon dioxide snow which formed within the chamber was retained in major part in the chamber. Uncondensed gas was released through a valved line into the atmosphere. To the best of its present information, defendant states that the pressure in each of the chambers reached and exceeded the so-called tripple point (about 60-62 pounds) although specific information thereon is not available at this time; and then the pressure dropped to substantially atmospheric pressure. After the snow was compressed, the resulting product was in the form of a block, the blocks produced by the various men mentioned differing somewhat in degree of compactness.

L. H. POLDERMAN [40]

[Verified.]

[Endorsed]: Filed May 29, 1943. [41]

In the United States District Court  
Southern District of California

Central Division

Civil Action No. 1851-RJ

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY and INTERNATIONAL CARBONIC,  
INC.,

Plaintiffs,

vs.

NATURAL CARBONIC PRODUCTS, INC., a corpo-  
ration, GEORGE PEPPERDINE FOUNDATION, a  
corporation, L. H. POLDERMAN, W. L. BENSON  
and C. B. BENSON, Individually, and as a Copart-  
nership doing business under the fictitious firm name  
and style of NATURAL CARBONIC PRODUCTS,

Defendants.

FURTHER AMENDED AND SUPPLEMENTAL  
COMPLAINT

For Infringement of United States Letters Patent No.  
2,025,698

The plaintiffs, pursuant to Order of Court, hereby file  
their Amended and Supplemental Complaint and allege as  
follows:

## I

Each of the plaintiffs, International Carbonic Engineer-  
ing Company and International Carbonic, Inc., is a cor-  
poration organized and existing under the laws of the  
State of Delaware.

Defendant, Natural Carbonic Products, Inc., is a cor-  
poration organized and existing under the laws of the  
State of California.

Defendant, George Pepperdine Foundation, is a corporation organized and existing under the laws of the State of California. [42]

Defendants, L. H. Polderman, W. L. Benson and C. B. Benson, and each of them, are residents of the Southern District of California and are carrying on business as a copartnership under the fictitious firm name and style of Natural Carbonic Products within the Southern District of California, wherein the acts of infringement hereinafter complained of have been and are being committed.

## II

This action arises under the Patent Statutes of the United States, as hereinafter more fully appears.

## III

On December 24, 1935, United States Letters Patent No. 2,025,698 were duly and legally issued to plaintiff, International Carbonic Engineering Company, for an invention for gas solidifying apparatus; and since that date plaintiff, International Carbonic Engineering Company has been and still is the owner of those Letters Patent, and plaintiff, International Carbonic, Inc., or its predecessors, has been and still is the exclusive licensee of, to and under those Letters Patent with the right to sublicense others thereunder.

## IV

Defendant, Natural Carbonic Products, Inc., for a long time prior to the filing of the original Complaint herein on October 21, 1941, and until on or about July 1, 1943, infringed upon said Letters Patent by using the gas solidifying devices, apparatus, processes and inventions, claimed by said patent; that defendant, George Pepperdine Foundation, during all of said period was the owner of

eighty percent (80%) of the issued stock of said defendant, Natural Carbonic Products, Inc., and directed and controlled the activities of said corporation; that on or about July 1, 1943, the defendant, George Pepperdine Foundation, purchased all of the assets of said defendant corporation, Natural Carbonic [43] Products, Inc., and assumed all of the liabilities thereof, including any and all liabilities of said defendant, Natural Carbonic Products, Inc., arising from infringement of the Letters Patent in suit; that thereafter said defendant, George Pepperdine Foundation, caused said defendant, Natural Carbonic Products, Inc., to be dissolved pursuant to the laws of the State of California, said dissolution becoming effective October 25, 1943; that the defendant, George Pepperdine Foundation, acquired as part of the assets of said defendant, Natural Carbonic Products, Inc., the properties near Niland, California, whereon the gas solidifying devices and apparatus employed by said Natural Carbonic Products, Inc. in infringing the Letters Patent in suit were and are located; that on or about July 1, 1943, defendant, George Pepperdine Foundation, leased said properties near Niland, California, including said gas solidifying devices and apparatus, to the defendant, L. H. Polderman; that the defendants W. L. Benson and C. B. Benson, nephews of the defendant L. H. Polderman, acquired an interest in said lease; that from on or about July 1, 1943, said individual defendants, L. H. Polderman, W. L. Benson and C. B. Benson, have operated the said properties near Niland, California, and the said gas solidifying apparatus and devices thereon in infringement of the Letters Patent in suit and with the knowledge and consent of the defendant, George Pepperdine Foundation; that plaintiffs allege upon information and belief that the



defendant, George Pepperdine Foundation, receives a consideration for said lease to said L. H. Polderman and to said copartnership based upon the volume of dry ice manufactured by means of said gas solidifying apparatus and devices; that said individual defendants, L. H. Polderman, W. L. Benson and C. B. Benson, were connected and associated with the defendant, Natural Carbonic Products, Inc., prior to on or about July 1, 1943, and were fully familiar with the infringing activities of said defendant as carried out on said [44] properties near Niland, California, and that said defendant, L. H. Polderman, managed and directed said infringing activities; that the defendant, George Pepperdine Foundation, is the successor in interest to the defendant, Natural Carbonic Products, Inc., and has leased said properties near Niland, California, and said gas solidifying apparatus and devices to said individual defendants L. H. Polderman, W. L. Benson and C. B. Benson, with the knowledge that said individual defendants, L. H. Polderman, W. L. Benson and C. B. Benson would continue to employ said gas solidifying apparatus and devices in infringement of the Letters Patent in suit and said individual defendants since on or about July 1, 1943, have employed said gas solidifying apparatus and devices in infringement of said Letters Patent, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39, thereof, whereby said defendant, George Pepperdine Foundation, and said individual defendants, L. H. Polderman, W. L. Benson and C. B. Benson, have jointly and severally infringed thereon and will continue to do so unless enjoined by this court.

## V

Plaintiffs do not themselves manufacture or sell the patented devices, gas solidifying apparatus, but plaintiff.

International Carbonic, Inc., sublicenses others to manufacture said patented devices or to have the same manufactured for them, for their own use, and requires by all of its sublicense agreements that its sublicensees place the required statutory notice on all gas solidifying apparatus manufactured by or for them and each of them using or embodying the inventions under said Letters Patent, and plaintiffs allege upon information and belief that all of said sublicensees have placed the required statutory notice on such gas solidifying apparatus manufactured by or for and used by them and each of them under said Letters Patent. [45]

Wherefore, plaintiffs demand a preliminary and a final injunction against said defendants, and each of them, and those controlled by said defendants, and each of them, an accounting for profits and damages, and an assessment of costs against said defendants, and each of them.

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY

INTERNATIONAL CARBONIC, INC.

By LYON AND LYON

Their Attorneys

LYON & LYON

811 West Seventh Street

Los Angeles 14, California

HUGH S. MORRIS

LEONARD S. LYON

REGINALD CAUGHEY

Counsel.

[Endorsed] : Filed Feb. 28, 1944. [46]

[Title of District Court and Cause.]

FIRST AND AMENDED ANSWER TO FURTHER  
AMENDED COMPLAINT

Defendants Natural Carbonic Products, Inc., L. H. Polderman, W. L. Benson and C. B. Benson, and Natural Carbonic Products, a copartnership, for their answer to the further amended and supplement complaint, allege as follows:

I.

Admit that Natural Carbonic Products, Inc. was a California corporation and that L. H. Polderman, W. L. Benson and C. B. Benson are residents of the Southern District of California and are carrying on a copartnership under the name and style of Natural Carbonic Products, but deny all other allegations of paragraph I of said further amended complaint. [47]

II

Admit that this court has jurisdiction of cases arising under the Patent Statutes; defendants allege that plaintiffs are barred from prosecuting this action and are not entitled to relief of any nature whatsoever because they do not come into court with clean hands and instead are employing the process of this court in attempting to unlawfully extend purported patent monopolies in a manner adverse to public policy and interest, as is more fully set forth hereafter.

III

Deny the allegations of paragraph III except that they admit that United States Letters Patent No. 2,025,698 were issued on December 24, 1935.



#### IV

In answer to paragraph IV, defendants admit that George Pepperdine Foundation acquired all of the assets of Natural Carbonic Products, Inc. in consideration of the discharge of indebtedness of Natural Carbonic Products, Inc. to said Foundation of a total amount in excess of the value of such assets, on or about July 1, 1943; admit that Natural Carbonic Products, Inc. was dissolved pursuant to the laws of the State of California, said dissolution becoming effective October 25, 1943; admit that on June 30, 1943 the Foundation leased certain properties near Niland, California, to L. H. Polderman; admit that W. L. Benson and C. B. Benson are nephews of L. H. Polderman, and that said Polderman, W. L. Benson and C. B. Benson formed a copartnership operating under the name and style of Natural Carbonic Products; admit that the Foundation receives a consideration for said lease to said L. H. Polderman, a part of which consideration is based upon the net profits received by the defendant L. H. Polderman; denies each and every of the other allegations of said paragraph. [48]

#### V

Defendants admit that plaintiffs do not manufacture, sell or use devices and gas solidifying apparatus, and deny all other allegations of paragraph V of the further amended and supplemental complaint.

#### VI

Defendants allege on information and belief that the patentees Harry W. Cole and Malcolm W. McLaren, named in the Letters Patent in suit and purported to be the joint inventors, were not the original and first inventors of that which is alleged to be patented by said patent in suit, but that on the contrary, the thing or things

alleged to be patented by said Letters Patent No. 2,025,698 and all substantial or material parts thereof, have been shown, described, patented and published in various Letters Patent and publications, and had been known to, publicly used and invented by other persons in this country, including the applicants of and the patentees for and the authors of the patents and publications and the persons and corporations hereinafter listed, more than two years before the purported invention by the patentees named in the Letters Patent in suit, and more than two years before the filing of the application upon which the Letters Patent in suit were issued, and more than two years before the filing of a description and claims on said purported inventions:

Malcolm W. McLaren	Jackson Heights, New York
James W. Martin	111 Broadway, New York, New York
Gustave T. Reich	c/o Pennsylvania Sugar Refining Company, Philadelphia, Penn.

United States Patents

<u>Patent No.</u>	<u>Issued</u>	<u>Patentee</u>
338,034	Mar. 16, 1886	J. P. F. Cartier
467,783	Jan. 26, 1892	David A. Sailor [49]
530,526	Dec. 11, 1894	Daniel L. Holden
533,871	Feb. 12, 1895	D. Drummond
579,866	Mar. 30, 1897	Herbert S. Elworthy
760,191	May 17, 1904	Edward L. Gaylord
876,352		Holden
955,454	Apr. 19, 1910	William J. Fleming
1,004,214	Sep. 26, 1911	Joseph Stehlin
1,018,568	Feb. 27, 1912	Harry P. Julius
1,054,772	Mar. 4 1913	Daniel L. Holden

1,104,920	July	28, 1914	W. S. Osborne
1,288,255	Dec.	17, 1918	L. Stastney
1,350,247	Aug.	17, 1920	R. W. G. Stutske
1,520,936	Dec.	30, 1924	James H. Dennedy
1,613,362	Jan.	4, 1927	Samuel E. Sheppard et al
1,631,037	May	31, 1927	William B. Kochenderfer
1,643,590	Sep.	27, 1927	Thomas B. Slate
1,659,431	Feb.	14, 1928	W. S. Josephson
1,659,434	Feb.	14, 1928	J. W. Martin
1,659,435	Feb.	14, 1928	J. W. Martin
1,726,373	Aug.	27, 1929	M. G. Voightlander
1,760,953	June	3, 1930	James W. Martin
1,822,788	Sep.	8, 1931	Josef Stoffels
1,887,692	Nov.	15, 1932	James W. Martin
1,887,693	Nov.	15, 1932	James W. Martin

German Patents

130,647	1902	Schmitz
142,704	1903	Diamanti
154,333	1904	Ver. Masch. fabr.
209,223	1909	Kern [50]

French Patent

246,808	Aug.	12, 1895	Henderson
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British Patents

13,684	Aug.	13, 1891	C. R. C. Tichborne et al
7,436	Apr.	11, 1895	H. S. Elworthy
2,450	Jan.	31, 1906	E. G. Elworthy
237,681		1925	Slate
263,922		1927	Haynes
294,584	July	26, 1927	W. Heseling
294,614	July	26, 1927	W. Heseling

Publication

New Apparatus for Making Carbonic Acid Snow  
Compts. Rendu year 1884 (99,235)

Defendants ask leave to amend this answer to include other persons and corporations, patents and publications as soon as they are ascertained.

## VII

Defendants allege that each of the claims of the patent in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are null and void and allege that each of said claims is for an aggregation of elements, or for an aggregation of old steps and functions, each of which was old in the art at the time of the purported invention thereof by said Cole and McLaren; that the said claims are null and void because they describe steps and elements in terms of function or result; that each of the claims of the patent in suit is void and invalid because it attempts to patent the natural law, function and mode of operation of individually old elements without the production of a new or novel result; defendants allege that the Letters Patent in suit, and each and every one of the claims thereof, is invalid, void and of no [51] effect because said Letters Patent were inadvertently issued and because they purport to claim the results and functions of well known devices and steps and that what is purported to be covered by said Letters Patent is an aggregation of old and independent steps and elements, the functions and effect of each of said steps and elements being matters of common knowledge to those skilled in the art to which the patent pertains long before the alleged invention thereof by the purported patentees of the patent in suit.

## VIII

Defendants allege that the Letters Patent in suit, and each and every one of the claims thereof, is invalid, void and of no effect because the alleged invention or discovery purportedly described and claimed in said patent was

merely the result of the exercise of the ordinary faculties of reasoning aided by the special knowledge and facility of manipulation which are acquired through habitual and intelligent practice of the art, known as non-inventive mechanical skill, and was not a result of that inventive faculty which it is the purpose of the Constitution and the patent laws to encourage and reward.

## IX

As a further defense, defendants allege that Letters Patent No. 2,025,698 in suit are invalid, void and of no force or effect because the specification and claims do not disclose or describe the purported invention in such clear, full and exact manner as to permit others to practice the alleged invention and because the aggregation of parts and steps therein named is inoperative to perform and incapable of performing the results and functions set forth in the patent and fails to teach how, in what manner, by what means and under what conditions the purported inventions may be constructed and operated and the purported results obtained; that each of the claims of the patent in suit is invalid, void and of no force or effect because said Letters Patent [52] and claims fail to clearly, fully and unambiguously describe the purported invention in the manner required by law.

## X

Defendants allege that for the purpose of deceiving the public, the description and specifications filed by Cole and McLaren in the United States Patent Office were made to contain less than the whole truth relevant to their purported invention and more than is necessary to produce the desired effect; that said purported patentees and the plaintiffs herein jointly and severally knew for many years last past, and at all events prior to September 3, 1942,



that the patent in suit was defective and inoperative and that the claims thereof were invalid and included more than the alleged patentees had a right to claim, and that said Cole and McLaren had included in the claims of the patent, with deceptive intent, inoperative means and gases; that plaintiffs failed to apply for a reissue and failed to file a disclaimer in the manner provided for by law, and have purposely delayed taking such action in conformance to plaintiffs' conspiracy plan and attempt to extend their alleged monopoly contrary to the public interest; and that by reason of said failure and delay in filing a disclaimer, the patent in suit and each and every claim thereof is void.

## XI

As a further defense defendants allege that the Letters Patent in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are null and void because the purported patentees of the patent in suit did not present or solicit said claims until long after the subject matter thereof had been in public use; that the purported inventions described and claimed in said patent are not a part of the original invention, if any, made by Cole and McLaren, and that the claims in suit herein were introduced long after public use and knowledge of the [53] substance thereof, in an attempt to enlarge the scope of their patent application to appropriate that which had in the meantime come into public use.

## XII

As a separate defense, defendants allege that two presses of the same type and make, alleged to infringe



claims 4, 31, 32, 33, 34, 36, 38 and 39, were manufactured long prior to the issuance of the patent in suit, long prior to the solicitation of the claims which plaintiffs now aver are infringed, and not in infringement of any Letters Patent; that the said two presses were used by the prior owner thereof in the compression of carbon dioxide snow into blocks, and the construction and mode of operation of said presses were open and notorious and known to plaintiffs, their agents, officers, attorneys and affiliates long prior to the issuance of the patent in suit and prior to the solicitation and allowance of the claims now in suit herein; that plaintiffs did not notify the prior owner of said presses at any time and did not allege or contend that said presses or their use was in violation of the patent in suit herein or any other purported rights of plaintiffs, but on the contrary, acquiesced in and consented to the continued use of the presses by the prior owner thereof; that plaintiffs' failure to notify the prior owner of said presses was unreasonable and lulled the prior owner of said presses into a sense of security; that the defendants, believing in good faith that plaintiffs had no rights which could be violated or were violated by said presses, their construction and their operation, and relying upon plaintiffs' acquiescence to the continued use of said presses, purchased said presses from the prior owner thereof, made large investments in connection with the business in which said presses were employed, and otherwise changed defendants' position; that plaintiffs enlarged the scope of the Cole and McLaren application as filed so as to appropriate [54] that which had been previously

freely used by the defendants and the prior owner of said presses; that this present action was brought against the defendants without notice and that the aforesaid and other surrounding circumstances constitute laches on the part of the plaintiffs and prejudicial to these defendants, and that plaintiffs are not entitled to injunctive relief and are estopped from pressing this suit for infringement, accounting, damages or costs.

### XIII

Defendants further allege that Cole and McLaren, the purported inventors of the patent in suit, were not the true, original and joint inventors of the matters there described and claimed but instead surreptitiously and unjustly obtained the patent in suit for that which was in fact invented by James W. Martin, Gustave T. Reich and others who were using reasonable diligence in adapting and perfecting the same; that plaintiffs and those acting in concert therewith and pursuant to a premeditated attempt to unlawfully extend their patent monopoly, contrary to the public interest, suppressed and concealed the earlier invention made by James W. Martin, to the detriment of the public and these defendants, and that by reason of such surreptitious and unjust acts, the patent in suit is void and plaintiffs are barred from prosecuting this action or from any relief whatsoever.

### XIV

That said Letters Patent No. 2,025,698 in suit are invalid and that plaintiffs can not maintain this suit for infringement of any part of said patent, or recover costs

herein by reason of the fact that plaintiffs come into this court with unclean hands, because plaintiffs, in derogation of the public interest and defendants' rights and in contravention to the letter and spirit of the patent law and the Constitution of the United States and public policy, have attempted to extend this patent [55] grant beyond the legal term of seventeen years as provided by law, by suppressing and concealing earlier and other inventions pertaining to the same subject matter and by securing the grant of a succession of United States Letters Patent upon the same alleged invention, such succession of patents including:

No. 1,546,681 issued July 21, 1925 to Thomas B. Slate and expired July 21, 1942, entitled "Method and Apparatus for Producing Carbon Dioxide Snow";

No. 1,546,682 issued July 21, 1925 to Thomas B. Slate and expired July 21, 1942, entitled "Method and Apparatus for Producing Carbon Dioxide Snow and for Separating Same From the Gas";

No. 1,659,431 issued February 14, 1928 to Walter S. Josephson, entitled "Carbon Dioxide Freezing Apparatus, Method, and Product";

No. 1,659,434 issued February 14, 1928 to James W. Martin, Jr., entitled "Apparatus for Solidifying Carbon Dioxide";

No. 1,659,435 issued February 14, 1928 to James W. Martin, Jr., entitled "Method of and

Apparatus for Making Carbon Dioxide Snow”;

No. 1,735,094 issued November 12, 1929 to Thomas B. Slate, entitled “Method and Means for Making Carbon Dioxide Snow”;

No. 1,795,772 issued March 10, 1931 to Justus C. Goosmann, entitled “Dual Effect Compression Method and Apparatus for Producing Carbon Dioxide Snow”;

No. 1,814,195 issued July 14, 1931 to Norman M. Thomas, entitled “Apparatus for Making Carbon Dioxide Ice”; [56]

No. 1,818,816 issued August 11, 1931 to Hans Ruffer et al, entitled “Process and Apparatus for Obtaining Dense Carbon Dioxide Snow directly from Liquid Carbon Dioxide”;

No. 1,843,397 issued February 2, 1932 to David A. Marcus et al, entitled “Device for Forming and Storing Solid Carbon Dioxide”;

No. 1,870,691 issued August 9, 1932 to Robert R. Rust et al, entitled “Method of and Apparatus for Making and Shaping Solid Carbon Dioxide”;

No. 1,873,418 issued August 23, 1932 to Charles L. Jones, entitled “Method and Apparatus for Making Dry Carbon Dioxide Products”;

and many other patents, thereby attempting to provide the plaintiffs with a continuously extending monopoly upon the same alleged invention.

## XV

Defendants are informed and believe and therefore allege that while the application for Letters Patent No. 2,025,698 was pending in the United States Patent Office, the purported inventors thereof, Harry W. Cole and Malcolm W. McLaren, so limited and confined the claims of said application in view of the prior knowledge and published art and represented to the Patent Office officials such limited construction and meaning to the claims that the plaintiffs herein can not now seek for or obtain construction for such claims sufficiently broad to cover any apparatus or method made or used by these defendants.

## XVI

As another and further defense, defendants allege that the Letters Patent No. 2,025,698 in suit are void, invalid and of no effect because the matters purported to be described and claimed in said Letters Patent were not the joint invention [57] of said Harry W. Cole and Malcolm W. McLaren. Defendants allege on information and belief that Malcolm W. McLaren was the sole inventor of the subject matter purportedly described and claimed in the Letters Patent in suit and that the plaintiffs herein, having full knowledge that said Harry W. Cole was not the joint inventor with said Malcolm W. McLaren of the subject matter allegedly described and claimed in the patent in suit herein, failed to withdraw the said Harry W. Cole as a purported inventor and now have no right to recover damages and costs or either of them and that by



reason of such failure, neglect and delay in withdrawing the said Harry W. Cole, the patent in suit is void. [58]

\*      \*      \*      \*      \*      \*      \*      \*

Wherefore defendants pray:

1. That patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, be held invalid, null and void.

2. That a judgment and decree be entered denying the plaintiffs injunctive relief, or any relief whatsoever, and holding that the machines and presses owned and operated by the defendants and the modes of operation performed by defendants, and each of them, are not in infringement of said Letters Patent or any and all claims thereof.

3. That a judgment and decree be entered holding that the plaintiffs have used the purported patent rights contrary to the public interest and to the damage and injury of these defendants, and awarding such damages to defendants as to the Court may seem meet.

\*      \*      \*      \*      \*      \*      \*      \*

6. That the plaintiffs' complaint be dismissed, costs be assessed against the plaintiffs, and such further relief granted these defendants as to the Court may seem just.

HOWARD BURRELL  
1175 Subway Term. Bldg.  
Los Angeles, Calif.

C. A. MIKETTA  
210 W. 7th Street  
Los Angeles, Calif.

Attorneys for Defendants

[Endorsed]: Filed Mar. 27, 1944. [59]



[Title of District Court and Cause.]

FIRST ANSWER OF GEORGE PEPPERDINE  
FOUNDATION TO FURTHER AMENDED  
AND SUPPLEMENTAL COMPLAINT

Defendant George Pepperdine Foundation, for its answer to the Further Amended and Supplemental Complaint, admits, denies, and alleges as follows:

I.

Answering Paragraph I of the Further Amended and Supplemental Complaint, this answering Defendant states that it is without knowledge or information sufficient to form a belief as to the truth of the averment that each of the Plaintiffs, International Carbonic Engineering Company and International Carbonic, Inc., is, or either of them is, a corporation organized or existing under the laws of the State of Delaware or any other state; admits that [60] Defendant Natural Carbonic Products, Inc. was a corporation organized and existing under the laws of the State of California; admits that Defendant George Pepperdine Foundation is a corporation organized and existing under the laws of the State of California; admits that it is informed and believes that Defendants L. H. Polderman, W. L. Benson, and C. B. Benson, and each of them, are residents of the Southern District of California and are carrying on business as a copartnership under the name and style of Natural Carbonic Products; and denies each and every of the other allegations of said paragraph.

## II.

Answering Paragraph II of the Further Amended and Supplemental Complaint, this answering Defendant admits that this Court has jurisdiction over cases arising under the Patent Statutes of the United States; and alleges that Plaintiffs are barred from prosecuting this action and from any of the relief sought by said Further Amended and Supplemental Complaint, because they do not, and neither of them does, come into Court with clean hands, but instead Plaintiffs are, and each of them is, employing the process of the Court in a wrongful attempt to unlawfully extend purported patent monopolies to cover unpatented commodities adversely to public policy and interest and contrary to law.

## III.

Answering Paragraph III of the Further Amended and Supplemental Complaint, this answering Defendant admits that United States Letters Patent No. 2,025,698 were issued on December 24, 1935, to International Carbonic Engineering Company; and denies each and every of the other allegations of said paragraph. [61]

## IV.

Answering Paragraph IV of the Further Amended and Supplemental Complaint, this answering Defendant admits that prior to about July 1, 1943, it was the owner of some of the issued stock of Defendant Natural Carbonic Products, Inc.; denies that it was at any time the owner of more than approximately Sixty-six Per Cent (66%) of such issued stock; admits that on or about

July 1, 1943, it acquired all of the assets of Defendant Natural Carbonic Products, Inc. in consideration of the discharge of indebtedness of Natural Carbonic Products, Inc. to this answering Defendant of a total amount in excess of the value of such assets, which indebtedness this answering Defendant alleges upon information and belief Natural Carbonic Products, Inc. was unable to discharge in any other manner; admits that thereafter Defendant Natural Carbonic Products, Inc. was dissolved pursuant to the laws of the State of California; admits that said dissolution became effective October 25, 1943; admits that it acquired as part of the assets of Defendant Natural Carbonic Products, Inc. properties near Niland, California, whereon gas solidifying devices and apparatus employed by Defendant Natural Carbonic Products, Inc. were and are located; admits that on June 30, 1943, it leased said properties near Niland, California, including such gas solidifying devices and apparatus to Defendant L. H. Polderman; admits that Defendants W. L. Benson and C. B. Benson are nephews of Defendant L. H. Polderman; states that it is without knowledge or information sufficient to form a belief as to the truth of the averment that Defendants W. L. Benson and C. B. Benson, or either of them, acquired any interest in said lease; admits that it has known that Defendant L. H. Polderman has operated gas solidifying apparatus and devices upon said properties near Niland, California, from on or about July 1, 1943, that Defendant W. L. Benson and C. B. Benson have assisted Defendant L. H. Polderman in such operation, and it [62] has consented to such

operation; admits that it receives a consideration for said lease to Defendant L. H. Polderman, a part of which is based on the net profits received by Defendant L. H. Polderman; admits that the Defendants L. H. Polderman, W. L. Benson, and C. B. Benson were connected and associated with Defendant Natural Carbonic Products, Inc. prior to on or about July 1, 1943, and that Defendant L. H. Polderman managed and directed the activities of such corporation; admits that it leased such properties near Niland, California, and the gas solidifying apparatus and devices thereon to Defendant L. H. Polderman with the knowledge that Defendant L. H. Polderman would use such apparatus and devices and that Defendant W. L. Benson and C. B. Benson would probably assist him in such use; and denies each and every of the other allegations of said paragraph.

#### V.

Answering Paragraph V of the Further Amended and Supplemental Complaint, this answering Defendant admits that Plaintiffs do not themselves, and neither of them does itself, manufacture or sell devices or gas solidifying apparatus; and states that it is without knowledge or information sufficient to form a belief as to the truth of each and every of the other averments of said paragraph.

And as further and affirmative defenses this answering Defendant alleges as follows:

#### VI.

This answering Defendant alleges that the alleged invention or discovery claimed in said Letters Patent No.

2,025,698 was not patentable to the alleged inventors named therein under the provisions of R. S. 4886. 35 U. S. C. 31, and that therefore [63] said patent is, and each of the claims is, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39 are, invalid and void, because:

(a) Said alleged inventors, Harry W. Cole and Malcolm W. McLaren were not the original or first inventors of the alleged invention or discovery claimed in said Letters Patent or any material or substantial part thereof, but on the contrary the thing or things alleged to be patented by said Letters Patent and all substantial and material parts thereof were (if any invention or discovery were required), prior to the date of the alleged invention or discovery by the applicants for said Letters Patent invented or discovered by others, and more particularly those others identified in the following list and the applicants for those patents identified in the following list:

(b) The thing or things alleged to be patented by said Letters Patent and all material and substantial parts thereof were patented and described in printed publications in this or a foreign country before their alleged invention or discovery thereof or more than two years prior to the date of application for said Letters Patent, and more particularly the patents and publications identified in the following list;

(c) The thing or things alleged to be patented by said Letters Patent and all material and substantial parts thereof were known and used by others in this country before said alleged 'inventors' alleged invention or discovery thereof, and more particularly by those others identified



in the following list and the inventors named in the patents identified in the following list and the assignees named in said patents and by the authors of the articles appearing in the publications designated in the following list, residing at the addresses stated in said patents and publications; and

(d) The thing or things alleged to be patent by said Letters Patent and all material and substantial parts thereof [64] were in public use and on sale in this country for more than two years prior to the date of application for said Letters Patent, and more particularly by those identified in the following list and by the applicants for and the patentees of the patents and the authors of the publications hereinafter listed, residing at the addresses stated in said patents and publications:

United States Patents:

338,034	Mar. 16, 1886	J. P. F. Cartier
467,783	Jan. 26, 1892	David A. Sailor
530,526	Dec. 11, 1894	Daniel L. Holden
533,871	Feb. 12, 1895	D. Drummond
579,866	Mar. 30, 1897	Herbert S. Elworthy
760,191	May 17, 1904	Edward L. Gaylord
876,352	Jan. 14, 1908	Daniel L. Holden
955,454	Apr. 19, 1910	William J. Fleming
1,004,214	Sept. 26, 1911	Joseph Stehlin
1,018,568	Feb. 27, 1912	Harry P. Julius
1,054,772	Mar. 4, 1913	Daniel L. Holden
1,104,920	July 28, 1914	W. S. Osborne
1,288,255	Dec. 17, 1918	L. Stastney
1,350,247	Aug. 17, 1920	R. W. G. Stutzke
1,520,936	Dec. 30, 1924	James H. Dennedy



1,613,362	Jan. 4, 1927	Samuel E. Sheppard et al
1,631,037	May 31, 1927	William B. Kochenderfer
1,643,590	Sept. 27, 1927	Thomas B. Slate
1,659,431	Feb. 14, 1928	W. S. Josephson
1,659,434	Feb. 14, 1928	J. W. Martin
1,659,435	Feb. 14, 1928	J. W. Martin
1,726,373	Aug. 27, 1929	M. G. Voightlander
1,760,953	June 3, 1930	James W. Martin
1,822,788	Sept. 8, 1931	Josef Stoffels [65]
1,887,692	Nov. 15, 1932	James W. Martin
1,887,693	Nov. 15, 1932	James W. Martin

German Patents:

130,647	1902	Schmitz
142,704	1903	Diamanti
154,333	1904	Ver. Masch. fabr.
209,223	1909	Kern

French Patent:

246,808	Aug. 12, 1895	Henderson
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British Patents:

13,684	Aug. 13, 1891	C. R. C. Tichborne et al
7,436	Apr. 11, 1895	H. S. Elworthy
2,450	Jan. 31, 1906	E. G. Elworthy
237,681	1925	Slate
263,922	1927	Haynes
294,584	July 26, 1927	W. Heseling
294,614	July 26, 1927	W. Heseling

Publication:

New Apparatus for Making Carbonic Acid Snow  
Compts. Rendu year 1884 (99,235)

This answering Defendant asks leave to amend this answer to include other persons and corporations, patents and publications as soon as they are ascertained.

## VII.

This answering Defendant alleges that each of the claims of the patent in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39, is invalid and void because: [66]

(a) The alleged invention defined thereby is not in fact an invention or combination but is a mere aggregation of old elements or steps;

(b) Said claims, and each of them, do not comply with R. S. 4888, 35 U. S. C. 33, in that they do not, and none of them does, distinctly claim the part, improvement, or combination which the applicants claim as their invention or discovery, but on the contrary said claims, and each of them, attempt to patent a function or result;

(c) Said claims, and each of them, attempt to patent natural laws, functions, and operations not the statutory subject of invention and not any new or useful art, machine, manufacture, or composition of matter within the statutes in such case made and provided; and

(d) The Commissioner of Patents did not cause a proper examination to be made as to the alleged new invention or discovery defined by said claims and each of them, and, had such an examination been made properly, it would have appeared that the applicants for said Letters Patent were not entitled thereto, and said Letters Patent would not have been issued, and said Commissioner

exceeded his legal authority in granting and issuing said Letters Patent, and said Letters Patent were inadvertently issued.

### VIII.

This answering Defendant alleges that each of the claims of the patent in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39, is invalid and void because the alleged invention or discovery purportedly described and claimed in said patent was merely the result of the exercise of the ordinary faculties of reasoning aided by the special knowledge and the facility of manipulation which are acquired through habitual and intelligent practice of the art and was not the result of that inventive faculty which [67] it is the purpose of the Constitution and patent laws to encourage and reward and involved nothing more than the exercise of mere mechanical skill in view of the state of the art as known at the time of and long prior to the alleged invention or discovery thereof by the applicants for said Letters Patent, said state of the art including the prior patents and publications listed in Paragraph VI hereof.

### IX.

This answering Defendant alleges that each of the claims of the patent in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39, is invalid and void because the specification and claims do not comply with R. S. 4888, 35 U. S. C. 33, in that they do not describe the alleged invention or discovery in such full, clear, concise, and exact terms as to enable any person skilled in the

art or science to which it appertains or with which it is most nearly connected to make, construct, compound, or use the same, and in that they fail to explain the best mode in which the applicants contemplated applying the principle of their alleged invention or discovery so as to distinguish it from other inventions, and in that the claims do not, and none of them does, particularly point out or distinctly claim the part, improvement, or combination which the applicants claimed as their invention or discovery.

## X.

This answering Defendant alleges that each of the claims of the patent in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39, is invalid and void because for the purpose of deceiving the public the description and specification filed by Malcolm W. McLaren and Harry W. Cole were made to contain less than the whole truth relative to their alleged invention and more than [68] was necessary to produce the desired effect; because the patentees and the Plaintiffs, and each of them, knew for many years long past and prior to September 3, 1942, that the patent in suit was defective and inoperative, and that each of the claims thereof was invalid and void and included more than the patentees had a right to claim, and that said patentees had included in the claims of the patent inoperative means and gases with deceptive intent; and because Plaintiffs and the patentees have, and each of them has, failed to apply for a reissue patent and failed to file a disclaimer in the manner provided by law, and Plaintiffs and the patentees have, and each of them has,

purposely refrained from applying for a reissue and filing a disclaimer in an attempt to extend the alleged monopoly of the patent in suit to cover more than the patentees had a right to claim and to cover unpatented commodities pursuant to the plan of a conspiracy between the Plaintiffs and contrary to public policy, public interest, and law.

## XI.

This answering Defendant alleges that each of the claims of the patent in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39, is invalid and void because the patentees of the patent in suit did not present to the Patent Office or solicit from the Patent Office the allowance of said claims or any of them until long after the subject matter thereof had been the subject of public use and knowledge; because the alleged invention described and attempted to be covered in said claims, and each of them, was not a part of the original invention made by the applicants for the patent in suit, if any invention were made by them; and because said claims, and each of them, were first introduced into the application for the patent in suit and their allowance by the Patent Office was first sought long after public use and knowledge of the subject matter thereof in an attempt to enlarge the scope of the [69] patent in suit to appropriate that which had come into public use, become the subject of knowledge and use by others, and become a part of the public domain.

## XII.

This answering Defendant alleges on information and belief that two presses of the same type and make alleged



to infringe claims 4, 31, 32, 33, 34, 36, 38, and 39 of the patent in suit were manufactured long prior to the issuance of the patent in suit and long prior to the first presentation to the Patent Office and solicitation of allowance by the Patent Office of said claims and each of them; that the said two presses were used by a prior owner thereof in the compression of carbon dioxide snow into blocks, and both the construction and mode of operation of said presses, and each of them, were fully known to Plaintiffs, and each of them, and their agents, officers, attorneys, and affiliates long prior to the issuance of the patent in suit and prior to the first presentation to the Patent Office and first solicitation of the allowance by the Patent Office of said claims, and each of them; that Plaintiffs did not, and neither of them did, notify or allege or contend to the prior owner of said presses at any time that said presses, or either of them, or their use was in violation or infringement of the patent in suit herein, or any of the claims thereof, or was in violation of any right of Plaintiffs, or either of them, but on the contrary Plaintiffs, and each of them, acquiesced in and consented to the continued use of said presses, and each of them, by the prior owner thereof; that the failure of the Plaintiffs, and each of them, to notify the prior owner of said presses of the claim of infringement asserted in the Further Amended and Supplemental Complaint was unreasonable and lulled the prior owner of said presses into a sense of security and a conviction that the construction and operation of said presses, [70] and each of them, were not a violation or infringement of any patent of the Plaintiffs, or either of them; that some of the Defendants, believing in good faith that Plaintiffs had no patents or other rights which could be or were violated or infringed by said presses, or either of them, or their operation, and in reliance



upon the acquiescence of the Plaintiffs, and each of them, to the continued use of said presses, and each of them, purchased said presses from said prior owner thereof, made large investments in connection with the business in which said presses were employed, and in other respects changed their position; that Plaintiffs enlarged the scope of the patent in suit as filed in an attempt to appropriate that which had been previously freely used by such Defendants and the prior owner of said presses; and that Plaintiffs are, and each of them is, thereby estopped to maintain, and guilty of such laches as constitute a bar to the maintenance of, this suit, and estopped to recover or secure, and barred from, the recovery and securing of any damages and any other relief sought by Plaintiffs.

### XIII.

This answering Defendant alleges upon information and belief that Harry W. Cole and Malcolm W. McLaren, the purported inventors of the patent in suit, were not the true, original, and joint inventors of the matters there described and claimed but instead surreptitiously and unjustly obtained the patent in suit for that which was in fact invented by James W. Martin, Gustave T. Reich, and others who were using reasonable diligence in adapting and perfecting the same; that Plaintiffs and those acting in concert therewith and pursuant to a premeditated attempt to unlawfully extend their patent monopoly, contrary to the public interest, suppressed and concealed the earlier invention made by James W. Martin, to the detriment of the public and the Defendants; and that by reason of such surreptitious and unjust acts the patent in [71] suit is void, and Plaintiffs are barred from prosecuting this action and from any relief whatsoever.

## XIV.

This answering Defendant alleges upon information and belief that the patent in suit, and each of the claims thereof, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39, is invalid and void and that Plaintiffs cannot maintain this suit or recover costs herein because, as this Defendant is informed and believes and therefore alleges, Plaintiffs come into this Court with unclean hands, because Plaintiffs, in derogation of the public interest and Defendant's rights and in contravention to the letter and spirit of the patent law and the Constitution of the United States and public policy, have attempted to extend this patent grant beyond the legal term of seventeen years as provided by law, by suppressing and concealing earlier and other inventions pertaining to the same subject matter, and by securing the grant of a succession of United States Letters Patent upon the same alleged invention, such succession of patents including:

No. 1,546,681 issued July 21, 1925, to Thomas B. Slate and expired July 21, 1942, entitled "Method and Apparatus for Producing Carbon Dioxide Snow":

No. 1,546,682 issued July 21, 1925, to Thomas B. Slate and expired July 21, 1942, entitled "Method and Apparatus for Producing Carbon Dioxide Snow and for Separating same From the Gas":

No. 1,659,431 issued February 14, 1928, to Walter S. Josephson, entitled "Carbon Dioxide Freezing Apparatus, Method, and Product":

No. 1,659,434 issued February 14, 1928, to James W. Martin, Jr., [72] entitled "Apparatus for Solidifying Carbon Dioxide":

- No. 1,659,435 issued February 14, 1928, to James W. Martin, Jr., entitled "Method of and Apparatus for Making Carbon Dioxide Snow";
- No. 1,735,094 issued November 12, 1929, to Thomas B. Slate, entitled "Method and Means for Making Carbon Dioxide Snow";
- No. 1,795,772 issued March 10, 1931, to Justus C. Goosmann, entitled "Dual Effect Compression Method and Apparatus for Producing Carbon Dioxide Snow";
- No. 1,814,195 issued July 14, 1931, to Norman M. Thomas, entitled "Apparatus for Making Carbon Dioxide Ice";
- No. 1,818,816 issued August 11, 1931, to Hans Rufener et al., entitled "Process and Apparatus for Obtaining Dense Carbon Dioxide Snow Directly From Liquid Carbon Dioxide";
- No. 1,843,397 issued February 2, 1932, to David A. Marcus et al, entitled "Device for Forming and Storing Solid Carbon Dioxide";
- No. 1,870,691 issued August 9, 1932, to Robert R. Rust, et al, entitled "Method of and Apparatus for Making and Shaping Solid Carbon Dioxide";
- No. 1,873,418 issued August 23, 1932, to Charles L. Jones, entitled "Method and Apparatus for Making Dry Carbon Dioxide Products";

and many other patents, thereby attempting to provide the Plaintiffs with a continuously extending monopoly upon the same alleged invention. [73]

## XV.

This answering Defendant is informed and believes and therefore alleges that, while the application for Letters Patent No. 2,025,698 was pending in the United States Patent Office, the purported inventors thereof, Harry W. Cole and Malcolm W. McLaren, so limited and confined the claims of said application in view of the prior knowledge and published art and represented to the Patent Office officials such limited construction and meaning to the claims that the Plaintiffs herein cannot now seek for or obtain construction for such claims sufficiently broad to cover any apparatus or method made or used by any Defendant.

## XVI.

This answering Defendant alleges that the patent in suit, and each of the claims thereof, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39, is invalid and void because as this Defendant is informed and believes and therefore alleges, the matters purporting to be covered by said claims were not the joint invention of the applicants for said patent but were the sole invention of Malcolm W. McLaren; and because Plaintiffs, and each of them, having full knowledge that Harry W. Cole was not a joint inventor of the subject matter purported to be claimed by said claims failed to withdraw the said Harry W. Cole as a purported inventor.

## XVII.

Further answering, this Defendant denies that it has infringed, either directly or contributorily, any claim or claims of any patent owned by the Plaintiffs, or either of them, or in which the Plaintiffs, or either of them, have any right, title, or interest, and denies that it has done any act or thing invading any right of any nature whatsoever of the Plaintiffs, or either of them. [74]

Wherefore, Defendant prays:

(1) That patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38, and 39 thereof, be held invalid, null, and void.

(2) That a judgment and decree be entered denying the Plaintiffs injunctive relief and any relief whatsoever and holding that this Defendant is not infringing and has not infringed any claims of the patent in suit.

(3) That a judgment and decree be entered holding that the Plaintiffs have used the purported patent rights contrary to the public interest and to the damage and injury of Defendant, and awarding such damages to Defendant as to the Court may seem proper.

\* \* \* \* \*

(6) That the Further Amended and Supplemental Complaint be dismissed with costs to this Defendant, and that this Defendant have such other and further relief as to this Court may seem just.

Dated: At Los Angeles, California, this 30th day of March, 1944.

HARRIS, KIECH, FOSTER & HARRIS

By Ward D. Foster

Attorneys for Defendant George Pepperdine  
Foundation.

Ford W. Harris

Clarence F. Kiech

Ward D. Foster

Ford Harris, Jr.

Of Counsel.

[Endorsed]: Filed Apr. 3, 1944. [75]



[Title of District Court and Cause.]

## STIPULATION RE PATENTS

NOS. 1,546,681    1,546,682

It Is Hereby Stipulated, by and between all of the parties to the above entitled cause, through their respective attorneys, that the following patents shall, for all of the purposes of this trial, be considered as pleaded in the lists of patents in Paragraph VI of First Answer of George Pepperdine Foundation to Further Amended and Supplemental Complaint and in Paragraph VI of First and Amended Answer [of the other Defendants] to Further Amended Complaint as of the dates of service of such answers:

United States Patents: [76]

1,546,681	July 21, 1925	Thomas B. Slate
1,546,682	July 21, 1925	Thomas B. Slate

Dated: At Los Angeles, California, this 19th day of April, 1944.

HARRIS, KIECH, FOSTER &amp; HARRIS

By Ward D. Foster

Attorneys for Defendant George Pepperdine  
Foundation

C. A. Miketta

CASIMIR A. MIKETTA

Attorney for Remaining Defendants.

LYON &amp; LYON

By R. E. Caughey

Attorneys for Plaintiffs.

[Endorsed]: Filed Apr. 27, 1944. [77]



[Title of District Court and Cause.]

NOTICE TO PLAINTIFFS RE CORRECTIONS TO  
ANSWERS TO PLAINTIFFS INTERROGA-  
TORIES

L. H. Polderman, former President of Natural Carbonic Products, Inc., on behalf of defendants Natural Carbonic Products Inc., L. H. Polderman, W. L. Benson and C. B. Benson, individually and as a copartnership Natural Carbonic Products, states:

That the further answers to plaintiffs' interrogatories verified by him on May 29, 1943, have been reviewed in the light of plaintiffs' refusal to state what is meant by a "closed chamber" (defendants' request for admissions No. 33 and answer thereto) and, in order to prevent any misunderstanding the following amplification and correction is made to defendants' answers to [78] plaintiffs' interrogatories:

All interrogatories referring to a closed chamber or a closing head, or a head in chamber closing position, such as Interrogatory 38, and answers thereto, should be read and understood in the light of Interrogatory 23 and the answer thereto, wherein it is stated that gas is permitted to escape from the chamber of each press while such chamber is supplied with liquid carbon dioxide and during the period of solidification.

That the interrogatories and the answers thereto should be read and understood to mean that defendants have not at any time employed a closed chamber, this last phrase

meaning a chamber without an opening through which gas may and does pass.

That answer 20 (b) to plaintiffs' interrogatories may be amplified in order to make it more understandable in the light of Interrogatory 25. Interrogatory 25 reads as follows:

"(25). Which of said chambers is substantially closed to the atmosphere during the pressing stroke of the ram or plunger?"

Answer 25 reads as follows:

"25. None of them."

Answer 20 (b), in amplified form, is given herewith:

"20 - (b). Defendant does not understand this interrogatory but volunteers the following: After the valve admitting liquid carbon dioxide is shut off manually, the pressure in the chamber starts dropping and when the pressure is below 25 pounds gauge and sometimes when the pressure is closed to atmospheric, an air vent or valved opening to the atmosphere is opened while the blow back line or return line connecting the chamber with the rest of the system is closed, the opening of the air vent to the atmosphere permitting the gas remaining in the chamber to blow off to the atmosphere. The platens and rams are then manually operated as stated in [79] Interrogatory 19. Defendant does not know what specific pressure exists in the snow while it is being compressed into a block but believes that the pressure is not above atmospheric because during the actual compression of the snow the lower platen is in a lowered position whereby additional gas escapes around the lower end of the chamber."

The answer to Interrogatory 13 should be changed to more correctly state:

“(13). To the best of our understanding of this interrogatory, the compressing plunger ejects the block of solid carbon dioxide from each of the Frick presses; in the HPM press the compressing plunger does not eject the compressed block of carbon dioxide.”

The answer to Interrogatory 39 may be amplified by the addition of the following:

“In the HPM press the lower platen drops under the influence of gravity and is not driven or positively moved by mechanical means to a lowered position.”

That blue prints exhibits 9 and 10 filed October 20, 1942, should show an air vent leading from and communicating with each of the chambers, such air vent placing said chambers in communication with the atmosphere. That the blue print referring to the HPM press should be corrected to show that the scale is  $1\text{-}1/2$  inches = 1 foot instead of  $1/2$  inch = 1 foot. That the same blue print should show that the lower platen, on the corrected scale is about  $1\text{-}3/4$  inches high; that the snow chamber to the corrected scale should be 20 inches wide, the lower platen being about  $3/16$  inch smaller so as to easily move into the lower end of the snow chamber.

Blue prints including these corrections are attached hereto and marked exhibits A and B. Deponent states, on information and belief that copies of the appended corrected blueprints were discussed and left [80] with

plaintiffs' counsel on April 12, 1944, at which time plaintiffs' counsel did not refuse to accept said corrected prints in lieu of Exhibits 9 and 10 hereinabove referred to; that on Monday, April 24, 1944, plaintiffs' counsel refused to stipulate that said prints truly and accurately represented defendants' presses.

Deponent, on information and belief, states that the diagrams, Exhibits C, D, E and F attached hereto, were submitted to plaintiffs' counsel on April 12, 1944; deponent states that said diagrams correctly represent the various successive operations of the HPM press of the defendants and the relative positions of the parts of such press; deponent states that the defendants' operations of its Frick presses are no different from the operation of its HPM press. Deponent states, on information and belief, that on April 12, 1944, plaintiffs' counsel did not refuse to stipulate as to the said exhibits C, D, E and F, but did refuse to stipulate to such exhibits on April 24, 1944.

L. H. POLDERMAN

[Verified.] [81]

[Title of District Court and Cause.]

NOTICE TO PLAINTIFFS BY DEFENDANTS RE  
PRIOR ART TO BE RELIED UPON

For the purpose of facilitating Plaintiffs' preparation for trial, Defendants, and each of them, hereby notify the Plaintiffs, and each of them, that it is the present intention of Defendants not to rely upon the following patents pleaded in their answers to the Further and Amended Supplemental Complaint:

United States Patents:

1,004,214	Sept. 26, 1911	Joseph Stehlin
1,613,362	Jan. 4, 1927	Samuel E. Sheppard, et al
1,760,953	June 3, 1930	James W. Martin [89]

French Patent:

246,808 Aug. 12, 1895 Henderson

Dated: At Los Angeles, California, this 12th day of April, 1944.

HARRIS, KIECH, FOSTER & HARRIS

By Ward D. Foster

Attorneys for Defendant George Pepperdine  
Foundation

C. A. Miketta

CASIMIR A. MIKETTA

Attorney for the Remaining Defendants.

[Endorsed]: Filed April 27, 1944. [90]

[Title of District Court and Cause.]

NOTICE TO PLAINTIFFS BY DEFENDANTS RE  
PRIOR ART TO BE RELIED UPON

For the purpose of facilitating Plaintiffs' preparation for trial, Defendants, and each of them, hereby notify the Plaintiffs, and each of them, that it is the present intention of Defendants not to rely upon the following patents pleaded in their answers to the Further and Amended Supplemental Complaint:

United States Patents:

579,866	Mar. 30, 1897	Herbert S. Elworthy	
1,350,247	Aug. 17, 1920	R. W. G. Stutzke	
1,520,936	Dec. 30, 1924	James H. Dennedy	
1,887,693	Nov. 15, 1932	James W. Martin	[91]

British Patent:

2,450	Jan. 31, 1906	E. G. Elworthy
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German Patents:

130,647	1902	Schmitz
142,704	1903	Diamanti
154,333	1904	Ver. Masch. fabr.
209,223	1909	Kern

It is the present intention of the Defendants to rely upon the following additional patents:

German Patent:

508,168	1928	Maschinenfabrik Eblingen
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Swiss Patent:

129,690	July 27, 1927	Hessling
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Dated: At Los Angeles, California, this 1st day of May, 1944.

HARRIS, KIECH, FOSTER & HARRIS  
By Ward D. Foster

Attorneys for Defendant George Pepperdine  
Foundation.



C. A. Miketta

CASIMIR A. MIKETTA

Attorney for the Remaining Defendants.

[Endorsed]: Filed May 2, 1944. [92]

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[Title of District Court and Cause.]

ORDER

Defendants having made a verified showing in support of a Motion, heard in open Court during the trial of the above entitled cause, for leave to take depositions with respect to records of Eppenbach Inc., of Long Island City, New York, said records being relevant to the issues now before the Court:

It Is Hereby Ordered:

That defendants may take depositions of Edwin G. Eppenbach and other witnesses having knowledge of the facts with regard to records of Eppenbach, Inc., comprising defendants' Exhibit R for identification attached hereto, and such other records in the possession of Eppenbach, Inc., as are material to [95] the issue to which said Exhibit R pertains, said depositions to be taken before a Notary at New York or Long Island City, New York, and to be completed by June 6, 1944.

Defendants shall notify plaintiffs as to the precise place where and time when said depositions are to be taken, on or before June 1, 1944.

Dated: This 30th day of May, 1944.

RALPH E. JENNEY

United States District Judge

[Endorsed]: Filed May 30, 1944. [96]

[Minutes Saturday, July 15, 1944]

Present: The Honorable Ralph E. Jenney, District Judge.

This cause coming on for further trial; Leonard S. Lyon, Esq., appearing as counsel for plaintiffs; C. A. Miketta, Esq., appearing for Natural Carbonic Products, Inc., W. L. and C. B. Benson, and L. H. Polderman; Ward Foster, Esq., appearing for Geo. Pepperdine Foundation; H. A. Dewing and C. W. McClain, Court Reporters, being present and reporting the proceedings:

The Court renders opinion and decision. Judgment is for plaintiff on the counterclaim.

Court recesses at 11 A. M. and reconvenes at 11:10 A. M.; all present as before.

The Court resumes rendering decision. Each claim of the patent in suit is found invalid for lack of invention and the Court holds there is no infringement and orders judgment for defendants with costs, counsel for defendants to prepare and serve findings and conclusions and form of decree, and counsel for plaintiffs to do likewise on the counterclaim and submit same to defendants; both sides to have two weeks to prepare and submit documents and thereafter each side to have two weeks for objections. [99]

[Title of District Court and Cause.]

## FINDINGS OF FACT AND CONCLUSIONS OF LAW

This cause coming before the Court for trial on final hearing and trial being had on twenty-one days, during which witnesses were heard, demonstrations had and observed by the Court, exhibits filed and considered, and briefs having been filed and oral argument had on two days, the Court having rendered its decision and being fully advised in the premises, does hereby make the following findings of fact and conclusions of law: [100]

### Findings of Fact

1. Plaintiffs, International Carbonic Engineering Company (hereafter referred to as "Engineering") and International Carbonic, Inc. (hereinafter referred to as "International") are Delaware corporations in good standing.

2. Plaintiff Engineering is the owner of the legal title to the Cole and McLaren patent No. 2,025,698 in suit. Plaintiff International is the exclusive licensee thereunder with right to grant sublicenses, subject to outstanding licenses previously granted.

3. Prior to its dissolution in July 1943, defendant Natural Carbonic Products, Inc., a California corporation, was engaged in the manufacture of solid carbon dioxide at its plant at Niland, California. Defendant George Pepperdine Foundation, a California corporation, is the owner of the property upon which the plant is located and since July 1943, has leased such property to National Carbonic Products, a copartnership composed of the individual defendants L. H. Polderman, W. L. Ben-

son and C. B. Benson, residents of this district and engaged in the manufacture of solid carbon dioxide at said plant.

4. That prior to the trial of this action plaintiffs offered to the defendant Natural Carbonic Products, Inc. a license which plaintiffs had granted to others under a number of plaintiffs' patents, including the patent in suit, said license containing the provision that royalty was to be paid International on each ton of solid carbon dioxide manufactured by or for the licensee "whether or not such solid carbon dioxide has been manufactured in accordance with the methods, processes and apparatus of any one of the licensed patents." [101]

5. That it has not been satisfactorily proven and established that any license granted or offered by plaintiffs to others under plaintiffs' patents, including the patent in suit, contains any provisions constituting an unjust or unfair use of patent rights or contrary to public policy or that said plaintiffs in granting or offering said license attempted so to do.

6. That the license agreements heretofore granted or offered to others by plaintiffs, including the defendant Natural Carbonic Products, Inc., have been amended to provide for the payment of royalty by licensee "for each and every ton" of solid carbon dioxide manufactured by or for, "and sold or used hereunder by the licensee \* \* \* having at the time of said sale a license from Licensor under the patents licensed hereunder."

7. That it has not been satisfactorily proven and established that the plaintiffs solely or acting with others have attempted to control or regulate the sales price at which solid carbon dioxide was sold by the defendants, or any of them.

8. That it has not been satisfactorily proven and established that the plaintiffs solely or acting with others have attempted to intimidate the defendant, Natural Carbonic Products, Inc., into concerted or any price changes with any alleged affiliates of said plaintiffs.

9. That it has not been satisfactorily proven and established that any notices relating to plaintiffs' patent sent or caused to be sent to the trade were sent in bad faith or for any other reason than to advise said trade of plaintiffs' rights thereunder. [102]

10. That it has not been satisfactorily proven and established that the plaintiffs solely or acting with others have interfered in any manner with the disposal or sale of carbon dioxide by independent manufacturers, including the defendant, Natural Carbonic Products, Inc.

11. That it has not been satisfactorily proven and established that the plaintiffs solely or acting with others by price cutting, or threats of litigation, or coercion, or intimidation, restricted or eliminated free competition in the manufacture, disposal or sale of carbon dioxide in liquid or solid form.

12. That it has not been satisfactorily proven and established that this action was brought against the defendants, or any of them, in bad faith or for any other purpose than to establish the question of validity and infringement of the patent in suit.

13. That it has not been satisfactorily proven and established that plaintiffs solely or acting with others have represented that defendants, or any of them, will not be able to supply their customers with solid carbon dioxide because plaintiffs are sole owners of methods and devices for the manufacture of said solid carbon dioxide.



14. That it has not been satisfactorily proven and established that defendants, or any of them, have suffered any loss or damage by reason of any alleged violations by plaintiffs of the Anti-Trust Laws of the United States or any alleged acts of unfair competition or by any other unlawful acts of plaintiffs alleged in said counter-claims, or either of them. [103]

15. The patent in suit, No. 2,025,698, was issued December 24, 1935 and names Cole and McLaren as the inventors and relates to improvements in gas solidifying apparatus. Defendants are charged with infringing claims 4, 31, 32, 33, 34, and 36 pertaining to a machine for making solid carbon dioxide, and claims 38 and 39 covering a method or process of making solid carbon dioxide. The specific machines charged with infringement consist of two Frick presses which make blocks of solid carbon dioxide measuring 10" x 10" x 10" and an HPM press which makes blocks measuring 20" x 20" x 10".

16. The patent in suit describes two forms of machines for making blocks of solidified carbon dioxide, one illustrated in Figs. 1, 2 and 3, and the other illustrated in Fig. 5. Both machines are to be used with a liquefying and pressure control system, shown in Fig. 1. The machine of Fig. 2 is a horizontal machine and that of Fig. 5 is a vertical machine. Both machines include the same structural elements and the relationship between those elements is identical in the two machines. Both machines perform the same function and produce the same result.

17. As filed, the application for the patent in suit was entitled "Snow Machine" and references were numerous to "snow". By amendment during the prosecution of the application, the words "solidified gas" were substituted for the word "snow". Nowhere in the application as filed or



in the patent as issued is any reference made to triple point ice or any of the specific conditions under which it may be produced.

No process claims were solicited in the application as filed. About seven years later, and more than two years after such operations were quite well known in the industry and in public use, the two method claims asserted by plaintiffs to cover such triple point operations were added by amendment dated November 18, 1935. [104]

Applicants attempted to secure the allowance of claims differing from those here in issue, in that they did not define the solidifying and compressing chamber as closed or gas-tight, and such claims were rejected upon the prior art and amended by the applicants.

Neither machine described in the patent in suit was knowingly operated to produce compressed blocks of triple point ice until after the filing of the application for the patent in suit.

18. The evidence establishes that J. W. Martin, while in the employ of Prest-Air Corporation, at New York and Maspeth, Long Island, during the first part of 1925, had constructed under his direction unitary machines for solidifying and pressing carbon dioxide into blocks; that said unitary Martin machines contained elements in the same relationship and with the same functions as required by the claims of the patent in suit.

19. The evidence establishes that the Martin unitary machines were openly, successfully and commercially used in manufacturing operations in this country and performed the same function, operated in the same manner by the performance of the same steps and obtained the same result as that attributed to the patent in suit, at least during the first part of 1925, and more than two years be-

fore application was made for the patent in suit; that Martin and his engineer, Hood, disclosed the construction and operation of the unitary Martin machines to McLaren at least as early as October 1926.

20. Plaintiffs' expert admitted there was nothing new or in the nature of an invention in the apparatus of Fig. 5 of [105] the patent in suit except the double jacket 102 and the dividing and separating members 110 or in the apparatus of Fig. 1 except the exhauster 81 and diaphragm valve 84.

21. The claims relied upon are vague and indefinite as to some of the factors controlling the construction and operation of the apparatus and the performance of the method, are functional as to some others, and totally silent as to others. The claims in issue are deficient in specifying those controlling factors necessary for the construction and operation of the apparatus and the performance of the method. The controlling factors and details are omitted from the specification and therefore the claims derive no assistance from the specification.

None of the claims in issue includes, as elements, the double jacket, the dividing and separating members, the exhauster, or the diaphragm valve. The claims in issue are not directed to the avoidance of tamping and therefore cover apparatus and methods in which tamping may or may not be performed.

22. Prior to the earliest date of invention asserted by plaintiffs for the subject matter of the patent in suit, there was known to men skilled in the art to which the patent in suit relates and to both Cole and McLaren an apparatus and method for the solidification of liquid carbon dioxide and its compression into blocks for commercial use which is referred to in the testimony as the

"snow tank apparatus and method." This snow tank apparatus and method was substantially as follows: The snow tank included a closed chamber with a liquid carbon dioxide inlet connected to the chamber and provided with a control valve and a carbon dioxide gas outlet connected to the chamber and provided with a control valve for removing the portion of the carbon dioxide which was not solidified in the chamber. This snow tank apparatus included a press comprising a chamber and a top and [106] bottom movable platen and hydraulic means for actuating the press. In the operation of the snow tank apparatus liquid carbon dioxide was delivered to the solidification chamber while the chamber was closed and unsolidified carbon dioxide was withdrawn through the gas outlet. In the operation of the solidification chamber of the snow tank apparatus the pressure in the chamber varied during the introduction of the liquid carbon dioxide, in some instances going above 30 pounds per square inch gauge, and, during the solidification of the carbon dioxide, the evolved carbon dioxide gas was withdrawn through the gas outlet and returned to the system. When the desired mass of solid carbon dioxide was accumulated in the chamber, the control valve in the liquid inlet line was shut off, and, when the pressure in the solidification chamber approached atmospheric pressure, the control valve in the gas outlet line was shut off. Thereafter the solid carbon dioxide was compressed in the pressing chamber, which was separated from and adjacent the solidification chamber, by hydraulically actuating both the top and bottom platens, so that pressure was exerted upon the solid carbon dioxide simultaneously from both top and bottom. During the compressing operation, the gaseous  $\text{CO}_2$  in the solid  $\text{CO}_2$  is permitted to escape to atmosphere.

23. Prior to the earliest date of conception asserted by plaintiffs for the invention of the patent in suit, there was known to, or readily determinable without invention by, a man skilled in the art to which such patent relates that carbon dioxide solid was an article of commerce since 1907; that solid carbon dioxide could be formed by discharging liquid carbon dioxide into an air-tight, gas-tight chamber and relieving the pressure thereon; that in order to accomplish such solidification it was necessary to withdraw carbon dioxide in gaseous form from the gas-tight chamber, [107] that at the triple point pressure of 60.4 pounds per square inch gauge carbon dioxide ice could be formed in such a chamber; that solid carbon dioxide was formed in such a chamber by the evaporation of the liquid and that the carbon dioxide could be compressed in the same chamber; that the temperature of the liquid carbon dioxide supplied to the snow chamber affected the yield of snow; that solid carbon dioxide so produced could be compressed into blocks as a commercial commodity; that it was necessary during such compression of solid carbon dioxide into blocks to permit the gas to escape in order to produce a stable block; that pressing a material from both the top and bottom increased the density of the product; that a commercial size of the block was 10 x 10 inches; and that it was not necessary to tamp triple point carbon dioxide before pressing it into blocks.

It was common practice in the prior art to press the carbon dioxide into blocks while permitting the escape of gas to the atmosphere. The proper thickness of walls to sustain the desired pressure, the volume of gas generated when the liquid carbon dioxide was introduced into the chamber, the relative size of the inlets and outlets to the

chamber, all were readily determinable without invention by a man skilled in the art.

Devices commonly known in the prior art included the proper type of nozzles or inlets to supply liquid carbon dioxide to the apparatus, exhausters of the type employed in the patent in suit and their method of installation and operation, devices for reducing the pressure to atmospheric pressure during pressing operations, laboratory devices for forming and compressing solidified carbon dioxide similar to those disclosed in the Fleming and Julius patents, presses including a chamber with a movable and removable head and a plunger capable of compressing material in the chamber against the head. The patent in suit lacks invention in view of the state of the art. [108]

24. The elements and steps of the claims of the patent in suit which relate to the solidification of carbon dioxide are entirely independent of and are performed independently of the elements and steps of the apparatus for compressing the material, and produce no new function or result.

25. Claims 38 and 39 do not define or include the solidification of carbon dioxide under triple point conditions.

26. The solidification of carbon dioxide and its compression into blocks are disclosed in the following prior art patents:

Flemming	955,454	1910
Julius	1,018,568	1912
Slate	1,546,681	1925
Slate	1,546,682	1925
Slate	1,643,590	1927
Josephson	1,659,431	1928



Martin		1,659,434	1928
Martin		1,659,435	1928
Martin		1,887,692	1932
Slate	Br.	237,681	1925
Elworthy	Br.	7,436	1895
Haynes	Br.	236,922	1927

27. A unitary apparatus in which both the solidification of carbon dioxide and its compression into blocks are performed is disclosed in the following prior art patents:

Martin		1,659,435	1928
Martin		1,887,692	1932
Julius		1,018,568	1912
Josephson		1,659,431	1928
[109]			
Slate		1,643,590	1927
Elworthy	Br.	7,436	1895
Slate	Br.	237,681	1925

28. Every element and step of the claims in issue with the mode of operation described in the patent in suit are disclosed in the following prior art patents:

Cartier		338,034	1886
Sailor		467,783	1892
Holden		530,526	1894
Holden		876,352	1908
Holden		1,054,772	1913
Drummond		533,871	1895
Gaylord		760,191	1904
Osborne		1,104,920	1914
Stastney		1,288,255	1918
Kochenderfer		1,631,037	1927
Voightlander		1,726,373	1929



29. Apparatus claims in issue, numbers 4, 31, 32, 34 and 36, are met without inventive change by the disclosures of the following prior art patents:

Martin	1,887,692	1932
Flemming	955,454	1910
Julius	1,018,568	1912
Slate	1,643,590	1927
Slate Br.	237,681	1925

30. In defendants' HPM and Frick presses there are employed no exhauster and diaphragm valve like the exhauster 81 and diaphragm valve 84 of the patent in suit. In the operations of defendants' HPM and Frick presses no attempt is made to maintain a constant pressure in the solidification chamber during formation and collection of the solid carbon dioxide therein. In both the HPM and Frick presses, prior to the pressing operation, the solidifying and pressing chamber is open to the atmosphere, so that carbon dioxide gas is freely permitted to escape through a vent pipe, and such vent to the atmosphere remains open during all of the pressing operation.

After the solidification and prior to the pressing operation in both the HPM and Frick presses, one of the platens is moved, so that some carbon dioxide gas in the solidifying and compressing chamber may pass therearound to the atmosphere.

In the triple point operations performed by defendants' HPM and Frick presses the supply of liquid carbon dioxide to the chambers of the presses is shut off before

a desired mass of solid has been collected in the chambers.

31. The defendants' machines, the HPM and Frick presses, contain the same elements in the same relationship and have the same mode of operation as the elements in the prior art devices, including the Martin unitary machines and the disclosures of the prior patents hereinbefore referred to. The method of use of defendants' machines, the HPM and Frick presses, includes the same steps in the same relationship as the steps employed in the use of the machines of the prior art. Neither defendants' machines nor their method of use complained of as an infringement involve inventive change over the prior art.

#### Conclusions of Law

1. This Court has jurisdiction of the parties and of the subject matter. [111]

2. Title to United States Letters Patent No. 2,025,698 in suit is vested in plaintiff International Carbonic Engineering Company. Plaintiff International Carbonic, Inc. has exclusive right to issue sublicenses thereunder.

3. That the plaintiffs do not come into court with unclean hands.

4. The plaintiffs have not violated the anti-trust laws of the United States, and particularly sections 1, 2 or 3 of Title 15, United States Code.

5. United States Letters Patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, do not comply with the requirements of 35 U. S. C. 33 (R. S. 4888) and are void and invalid.

6. Machines embodying the invention allegedly contained in United States Letters Patent No. 2,025,698, and specifically defined in claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, were known to and used, and constructed and in successful public use within the United States by others than Harry W. Cole and Malcolm W. McLaren, and within the meaning of 35 U. S. C. 31 (R. S. 4886) more than two years prior to the date of filing of application for said patent in suit, and said Letters Patent No. 2,025,698 are invalid.

7. Harry W. Cole and Malcolm W. McLaren were not the first inventors of United States Letters Patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, and said Letters Patent are invalid and have at all times from the issue thereof been invalid. [112]

8. United States Letters Patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are void and invalid for lack of invention in view of the state of the art.

9. United States Letters Patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are void and invalid for lack of novelty.

10. United States Letters Patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are void and invalid as anticipated by prior structures and patents.

11. United States Letters Patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 there-

ot, are void and invalid on the ground that the purported patentees of the said Letters Patent claimed more than they invented.

12. United States Letters Patent No. 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are invalid as covering an aggregation of old elements and steps.

13. United States Letters Patent No. 2,025,698 in suit, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, have not been infringed by the acts of the defendants, or any of them; neither defendants' machines nor their methods of use complained of in this action embody or utilize any invention of the patent claims in issue.

14. The complaint will be dismissed on the merits, with judgment and decree in conformity to the findings and conclu- [113] sions, with costs to defendants. See written memo. opinion on file for further details.

Dated: This 13th day of November, 1944.

RALPH E. JENNEY

Judge

Approved as to form, this 8th day of November, 1944

LYON & LYON

By R. E. Caughey

Attorneys for Plaintiffs.

[Endorsed]: Filed Nov. 13, 1944. [114]

In the United States District Court  
Southern District of California

Central Division

Civil Action No. 1851-RJ

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY and INTERNATIONAL CARBONIC,  
INC.,

Plaintiffs,

vs.

NATURAL CARBONIC PRODUCTS, INC., a corporation, GEORGE PEPPERDINE FOUNDATION, a corporation, L. H. POLDERMAN, W. L. BENSON and C. B. BENSON, individually and as a copartnership doing business under the fictitious firm name and style of NATURAL CARBONIC PRODUCTS,

Defendants.

JUDGMENT AND DECREE DISMISSING FURTHER AMENDED AND SUPPLEMENTAL COMPLAINT ON THE MERITS AND DISMISSING COUNTERCLAIMS—WITH COSTS TO DEFENDANTS

This cause having come on for hearing on May 3-5, 9-12, 16-19, 23-26, 31, June 1, 3, 10, 14, 15, 16 and 17, upon the pleadings and proofs, briefs having been filed and oral argument had, and the Court being fully advised in the premises: now, therefore, upon consideration thereof and upon the findings of fact and conclusions of law filed concurrently herewith, It Is Hereby

Ordered, Adjudged and Decreed by the Court as Follows: [115]

1. This Court has jurisdiction of the parties and of the subject matter.

2. Defendants' counterclaims are dismissed.

3. Letters Patent No. 2,025,698 issued December 24, 1935 and assigned to International Carbonic Engineering Company, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are void and invalid.

4. Defendants Natural Carbonic Products, Inc., George Pepperdine Foundation, L. H. Polderman, W. L. Benson and C. B. Benson, individually and as a copartnership doing business under the fictitious firm name and style of Natural Carbonic Products, and each of them, have not infringed said Letters Patent No. 2,025,698 and claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, or any of said claims.

5. The complaints are dismissed with prejudice. Defendants shall recover from plaintiffs their costs of suit and disbursements, including reporters' fees, to be taxed by the Clerk. Costs taxed in the sum of \$1508.41. Retaxed \$1474.41.

Dated this 13th day of November, 1944.

RALPH E. JENNEY

United States District Judge

Approved as to Form this 8th day of November, 1944.

LYON & LYON

By R. E. Caughey

Attorneys for Plaintiffs

Judgment entered Nov. 13, 1944. Docketed Nov. 13, 1944. Book 29, page 44. Edmund L. Smith, Clerk; by P. D. Hooser, Deputy.

[Endorsed]: Filed Nov. 13, 1944. [116]



[Title of District Court and Cause.]

MOTION FOR SUBSTITUTION OF PARTY  
PLAINTIFF

Now comes plaintiff International Carbonic Engineering Company, pursuant to Rule 25 of the Rules of Civil Procedure, and respectfully shows unto the Court as follows:

At the time of the filing of the complaint herein plaintiff International Carbonic Engineering Company, a Delaware corporation, was the sole owner of the Letters Patent in suit No. 2,025,698, and plaintiff International Carbonic, Inc., a Delaware corporation, was a wholly owned subsidiary of plaintiff International Carbonic Engineering Company and the exclusive licensee of, to and under said Letters Patent No. 2,025,698 with the right to sublicense others thereunder; [117]

By instruments in writing executed on the 30th day of September, 1944, plaintiff International Carbonic Engineering Company acquired all of the property, assets and business, including the good will thereof, of the above named International Carbonic, Inc., and did thereby and does hereby assume each and every obligation and liability of said plaintiff International Carbonic, Inc.;

By written assignment executed on the 16th day of October, 1944, plaintiff International Carbonic Engineering Company became the owner and now is the owner of the entire right, title and interest in and to the Letters Patent in suit No. 2,025,698 (and other letters patent), together with all causes and rights of action arising out of or accruing from past infringement of said Letters Patent No. 2,025,698, which said assignment was duly recorded in the United States Patent Office on October 27, 1944, in Liber T-200, page 145;

On or about September 30, 1944, said plaintiff International Carbonic, Inc. was voluntarily and duly dissolved under and pursuant to the laws of said State of Delaware, and has no further right, title or interest of, to or under said Letters Patent in suit No. 2,025,698;

On November 13, 1944, a final judgment and decree was entered in this Court adjudging that said Letters Patent No. 2,025,698 and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof are void and invalid and not infringed by the defendants, and dismissing the complaint on the merits;

Pursuant to the statutes and laws of the United States, the time in which to take an appeal from said final judgment and decree has not yet expired;

Wherefore said plaintiff International Carbonic Engineering Company now comes into court and moves that it be [118] substituted as the sole plaintiff in the above entitled cause in the name, place and stead of said plaintiffs International Carbonic Engineering Company and International Carbonic, Inc., and that all pleadings and papers in said cause be deemed amended in accordance therewith to show such substitution, and that all further proceedings had or taken in said cause be so had or taken in the name of said International Carbonic Engineering Company as the sole plaintiff, the same to be without prejudice to, and subject to, any rights of the defendants herein; and further moves that an order be entered herein substituting said plaintiff International Carbonic Engineering Company as the sole plaintiff herein, in the name, place and stead of the above named plaintiffs.

LEONARD S. LYON

Attorney for Plaintiff International Carbonic Engineering  
Company

To C. A. Miketta and to Harris, Kiech, Foster & Harris  
and Ward D. Foster, Attorneys for Defendants:

Please take notice that the undersigned will bring the  
above motion on for hearing before this Court at its  
Court Room in the United States Post Office and Courts  
Building, Los Angeles, California, on Monday, the 22nd  
day of January, 1945, at ten o'clock in the forenoon of  
that day or as soon thereafter as counsel can be heard.

Dated this 16th day of January, 1945.

LEONARD S. LYON

Attorney for Plaintiff International Carbonic Engineering  
Company

[Endorsed]: Filed Jan. 17, 1945. [119]

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[Title of District Court and Cause.]

#### ORDER FOR SUBSTITUTION

This cause having come on for hearing on motion of  
plaintiff International Carbonic Engineering Company to  
be substituted as the sole plaintiff in the above entitled  
cause and the Court being fully advised in the premises,  
it is ordered that said plaintiff International Carbonic En-  
gineering Company be and it is hereby substituted as  
the sole plaintiff in the above entitled cause in the name,  
place and stead of the plaintiffs International Carbonic  
Engineering Company and International Carbonic, Inc.,  
and that the title of the action be amended accordingly,  
and that the action be continued by and in the name of  
the said International Carbonic Engineering Company,  
and that all further proceedings, had or taken in said  
cause be so had or taken [120] in the name of said In-  
ternational Carbonic Engineering Company as the sole  
plaintiff, without prejudice to any proceeding already had

in this action and without prejudice to and subject to any of the rights of the defendants herein.

Dated this 22nd day of January, 1945.

RALPH E. JENNEY,  
Judge.

Defendants hereby consent to the substitution of plaintiff International Carbonic Engineering Company as the sole plaintiff in the above entitled action, and further consent to the entry of the hereinabove order of substitution.

C. A. MIKETTA  
WARD D. FOSTER  
Attorneys for all Defendants

[Endorsed]: Filed Jan. 22, 1945. [121]

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In the United States District Court  
Southern District of California  
Central Division

Civil Action No. 1851-RJ

INTERNATIONAL CARBONIC ENGINEERING  
COMPANY,

Plaintiff

vs.

NATURAL CARBONIC PRODUCTS, INC., a corporation, GEORGE PEPPERDINE FOUNDATION, a corporation, L. H. POLDERMAN, W. L. BENSON and C. B. BENSON, individually and as a copartnership doing business under the fictitious firm name and style of NATURAL CARBONIC PRODUCTS,

Defendants

#### NOTICE OF APPEAL

Notice is hereby given that International Carbonic Engineering Company, plaintiff-appellant, does hereby ap-

peal to the Circuit Court of Appeals for the Ninth Circuit from the parts of the Final Judgment entered in this action on November 13, 1944, which adjudge as follows:

3. Letters Patent No. 2,025,698 issued December 24, 1935 and assigned to International Carbonic Engineering Company, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, are void and invalid.

4. Defendants Natural Carbonic Products, Inc., George Pepperdine Foundation, L. H. Polderman, W. L. Benson [122] and C. B. Benson, individually and as a copartnership doing business under the fictitious firm name and style of Natural Carbonic Products, and each of them, have not infringed said Letters Patent No. 2,025,698 and claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, or any of said claims.

5. The complaints are dismissed with prejudice. Defendants shall recover from plaintiffs their costs of suit and disbursements, including reporters' fees, to be taxed by the Clerk. Costs taxed in the sum of \$1474.41.

Dated: This 8th day of February, 1945.

LYON & LYON  
LEONARD S. LYON  
REGINALD E. CAUGHEY  
Attorneys for Plaintiff-Appellant

Mailed copy to Ward D. Foster, and Harris, Kiech, Foster & Harris; and mailed copy to Casimir A. Miketta, and Howard Burrell—attorneys for defendants.

[Endorsed]: Filed Feb. 8, 1945. [123]



[Title of District Court and Cause.]

PLAINTIFF-APPELLANT'S CONCISE  
STATEMENT OF POINTS ON APPEAL

The plaintiff-appellant, International Carbonic Engineering Company, pursuant to the provisions of Rule 75(d) of the Rules of Civil Procedure, specifies the following concise statement of points upon which it intends to rely on appeal:

1. That the District Court erred in determining that the defendants above named, and each of them, have infringed the patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof.

2. That the District Court erred in determining that the Letters Patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, does not comply with the [124] requirements of Title 35 United States Code, Section 33, and is void and invalid.

3. That the District Court erred in determining that the Letters Patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, is invalid as covering an aggregation of old elements and steps.

4. That the District Court erred in determining that the Letters Patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, is void and invalid for lack of invention in view of the state of the art.

5. That the District Court erred in determining that the Letters Patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, is void and invalid for lack of novelty.

6. That the District Court erred in determining that the Letters Patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, is void and invalid as anticipated by prior structures and patents.



7. That the District Court erred in determining that the Letters Patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, is void and invalid because the patentees claimed more than they invented.

8. That the District Court erred in determining that machines embodying the invention contained in Letters Patent 2,025,698, and particularly in the claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, were known to and used and constructed and in successful public use within the United States by others than Harry W. Cole and Malcolm W. McLaren more than two years prior to the date of filing of the application for the patent in suit and said Letters Patent is therefore invalid. [125]

9. That the District Court erred in dismissing the Complaints herein with prejudice and in awarding costs to defendants.

10. That the District Court erred in failing to determine that the Letters Patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, is good and valid in law.

11. That the District Court erred in failing to determine that the defendants above named, and each of them, have infringed the patent in suit 2,025,698, and particularly claims 4, 31, 32, 33, 34, 36, 38 and 39 thereof, by using machines embodying the invention claimed in claims 4, 31, 32, 33, 34 and 36 and employing the method claimed in claims 38 and 39.

Dated: This 8th day of February, 1945.

LYON & LYON

LEONARD S. LYON

REGINALD E. CAUGHEY

Attorneys for Plaintiff-Appellant

[Endorsed]: Filed Feb. 8, 1945. [126]

[Title of District Court and Cause.]

COST BOND ON APPEAL FROM JUDGMENT  
DISMISSING COMPLAINT

Know All Men By These Presents:

That United States Fidelity and Guaranty Company, a Maryland corporation, of Baltimore, Maryland, duly licensed to transact business in the State of California, is held and firmly bound unto Natural Carbonic Products, Inc., a corporation, George Pepperdine Foundation, a corporation, L. H. Polderman, W. L. Benson and C. B. Benson, a copartnership doing business under the fictitious firm name and style of Natural Carbonic Products, defendants in the above entitled cause, in the sum of Two Hundred Fifty Dollars (\$250) to be paid to said defendants, their heirs, executors, administrators, [127] successors or assigns, for which payment well and truly to be made United States Fidelity and Guaranty Company binds itself, its successors and assigns, firmly by these presents.

The condition of the above obligation is such:

That whereas International Carbonic Engineering Company, a Delaware corporation, of Wilmington, Delaware, is about to take an appeal to the United States Circuit Court of Appeals for the Ninth Circuit from that part of the Final Judgment entered in this cause on November 13, 1944, contained in Paragraphs 3, 4 and 5 thereof:

Now, Therefore, if the above named appellant shall prosecute said appeal to effect and answer all costs which may be adjudged against it if the appeal is dismissed, or the judgment affirmed, or such costs as the Appellate Court may award if the judgment is modified, then this obligation shall be void; otherwise to remain in full force and effect.

In accordance with Rule 8 of the Rules of Civil Procedure for the District Court of the United States for the Southern District of California, it is hereby agreed by the surety that in case of default or contumacy on the part of the principal or surety, the Court may, upon notice to them of not less than ten (10) days, proceed summarily and render judgment against them, or either of them, in accordance with their obligation and award execution thereon.

Signed, sealed and dated this 8th day of February, 1945.

[Seal]

UNITED STATES FIDELITY AND  
GUARANTY COMPANY

By O. D. Brick

Attorney-in-Fact

The Premium on This Bond Is \$10.00 for 1 year.

State of California

County of Los Angeles—ss:

On this 8th day of February in the year one thousand nine hundred and forty-five, before me, Agnes L. Whyte, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared O. D. Brick, known to me to be the duly authorized Attorney-in-fact of the United States Fidelity and Guaranty Company, and the same person whose name is subscribed to the within instrument as the Attorney-in-fact of said Company and the said O. D. Brick duly acknowledged to me that he subscribed the name of the United States Fidelity and Guaranty Company thereto as Surety and his own name as Attorney-in-fact.

In Witness Whereof, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

[Seal]

AGNES L. WHYTE

Notary Public in and for Los Angeles County, State of California

My Commission Expires Feb. 26, 1945

Examined and Recommended for Approval.

REGINALD E. CAUGHEY

Attorney for Appellant

I hereby approve the foregoing.

Dated this 8th day of February, 1945.

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Clerk.

[Entitled]: Filed Feb. 8, 1945. [128]

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[Title of District Court and Cause.]

BOND ON APPEAL SUPERSEDING JUDGMENT  
FOR COSTS

Know All Men By These Presents:

That United States Fidelity and Guaranty Company, a Maryland corporation, of Baltimore, Maryland, duly licensed to transact business in the State of California, is held and firmly bound unto Natural Carbonic Products, Inc., a corporation, George Pepperdine Foundation, a corporation, L. H. Polderman, W. L. Benson and C. B. Benson, a copartnership doing business under the fictitious firm name and style of Natural Carbonic Products, defendants in the above entitled cause, in the sum of Seven-

teen Hundred Fifty Dollars (\$1750) to be paid to said defendants, their heirs, executors, administrators, successors or [129] assigns, for which payment well and truly to be made United States Fidelity and Guaranty Company binds itself, its successors and assigns, firmly by these presents.

The condition of the above obligation is such:

That whereas International Carbonic Engineering Company, a Delaware corporation, of Wilmington, Delaware, is about to take an appeal to the United States Circuit Court of Appeals for the Ninth Circuit from that part of the Final Judgment entered in this cause on November 13, 1944, contained in Paragraphs 3, 4 and 5 thereof, and including the awarding of costs to the above named defendants in the amount of Fourteen Hundred Seventy-four Dollars Forty-one Cents (\$1474.41) for which judgment has been entered against International Carbonic Engineering Company;

Now, Therefore, if the appellant, International Carbonic Engineering Company, shall satisfy said judgment for costs in full, together with costs, interest and damages for delay, if for any reason the appeal is dismissed, or if the judgment is affirmed, and shall satisfy in full such modification of the judgment and such costs, interest and damages as the Appellate Court may adjudge and award, then this obligation shall be void, otherwise to remain in full force and effect.

In accordance with Rule 8 of the Rules of Civil Procedure for the District Court of the United States for the Southern District of California, it is hereby agreed by the surety that in case of default or contumacy on the part of the principal or surety, the Court may, upon notice to them of not less than ten (10) days, proceed summarily and render [130] judgment against them, or



either of them, in accordance with their obligation and award execution thereon.

Signed, sealed and dated this 8th day of February, 1945.

[Seal]

UNITED STATES FIDELITY AND  
GUARANTY COMPANY

By O. D. Brick

Attorney-in-Fact

The Premium on This Bond Is \$25.00 for 1 Year

State of California

County of Los Angeles—ss:

On this 8th day of February in the year one thousand nine hundred and forty-five, before me, Agnes L. Whyte, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared O. D. Brick, known to me to be the duly authorized Attorney-in-fact of the United States Fidelity and Guaranty Company, and the same person whose name is subscribed to the within instrument as the Attorney-in-fact of said Company and the said O. D. Brick duly acknowledged to me that he subscribed the name of the United States Fidelity and Guaranty Company thereto as Surety and his own name as Attorney-in-fact.

In Witness Whereof, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

[Seal]

AGNES L. WHYTE

Notary Public in and for Los Angeles County, State of  
California

My Commission Expires Feb. 26, 1945

Examined and Recommended for Approval

REGINALD E. CAUGHEY

Attorney for Appellant

Approved as to Amount of Bond

C. A. MIKETTA

Attorneys for Defendants other than

George Pepperdine Foundation

HARRIS, KIECH, FOSTER & HARRIS

WARD D. FOSTER

Attorney for Defendant George Pepperdine Foundation

I hereby approve the foregoing Bond on Appeal Superseding Judgment for Costs and order that, upon the filing of said Bond, execution upon said Judgment for Costs shall be stayed, this Court reserving the right to increase the amount of the Supersedeas Bond for sufficient cause shown.

Feb. 8, 1945.

RALPH E. JENNEY

Judge.

[Endorsed]: Filed Feb. 9, 1945. [131]

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[Title of District Court and Cause.]

### ORDER

Upon application of defendants-appellees and good cause, It Is Hereby Ordered that the time during which defendants-appellees may serve and file a designation of additional portions of the record, proceedings and evidence to be included in the record on appeal Be Extended up to and including March 23, 1945.

Dated: February 16, 1945.

RALPH E. JENNEY

Judge, United States District Court

[Endorsed]: Filed Feb. 17, 1945. [132]

[Title of District Court and Cause.]

STIPULATION EXTENDING TIME FOR FILING  
RECORD AND DOCKETING APPEAL

It Is Stipulated and Agreed, the Court consenting thereto, that Appellant's time within which the record on appeal may be filed and the appeal docketed in the Circuit Court of Appeals for the Ninth Circuit Be Extended to and including April 19, 1945.

Dated this 16th day of March, 1945.

LYON & LYON

LEONARD S. LYON

Attorneys for Appellant

C. A. MIKETTA

by WARD D. FOSTER

Attorneys for Appellees

Approved and So Ordered this 20th day of March,  
1945.

RALPH E. JENNEY

Judge

[Endorsed]: Filed Mar. 21, 1945. [133]

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[Title of District Court and Cause.]

STIPULATION EXTENDING TIME FOR FILING  
RECORD AND DOCKETING APPEAL

It Is Stipulated and Agreed, the Court consenting thereto, that Appellant's time within which the record on ap-

peal may be filed and the appeal docketed in the Circuit Court of Appeals for the Ninth Circuit be extended to and including May 9, 1945.

Dated: This 18th day of April, 1945.

LYON & LYON  
REGINALD E. CAUGHEY  
Attorneys for Appellant  
WARD D. FOSTER  
Attorneys for Appellees

It Is so Ordered this 18th day of April, 1945.

PAUL J. McCORMICK  
Judge.

[Endorsed]: Filed Apr. 19, 1945. [134]

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[Title of District Court and Cause.]

### STIPULATION AND ORDER

It Is Stipulated, by and between the respective counsel, that the Clerk of this Court shall transmit to the Clerk of the Ninth Circuit Court of Appeals, the original Exhibits in this action heretofore designated in plaintiff's Designation and defendants' Counterdesignation as part of the record on appeal; said original Exhibits to be retained pending the disposition of this appeal and thereafter to be returned to the Clerk of this Court.

It Is Further Stipulated, the plaintiff having filed one copy of the reporter's transcript as provided for in Rule 75. subdivision (b) of the Rules of Civil Procedure, that

the additional copy for the use of appellees need not be filed. [145]

It Is Further Stipulated that, in addition to the items heretofore designated to be included in the record on appeal by plaintiff's Designation and defendants' Counter-designation, the following items filed subsequent to said Designations be included in the record on appeal:

Order extending time to docket, dated February 16, 1945;

Order extending defendants' time to file a Counter-designation, dated February 16, 1945;

Order extending plaintiff's time to docket appeal, dated March 16, 1945;

Order further extending plaintiff's time to docket appeal, dated April 18, 1945;

This Stipulation and Order.

LYON & LYON

R. E. CAUGHEY

Attorneys for Plaintiff-Appellant

C. A. MIKETTA

WARD D. FOSTER

Attorneys for Defendants-Appellees.

It Is so Ordered this 7th day of May, 1945.

RALPH E. JENNEY

Judge.

[Endorsed]: Filed May 7, 1945. [146]



[Title of District Court and Cause.]

## CERTIFICATE OF CLERK

I, Edmund L. Smith, Clerk of the District Court of the United States for the Southern District of California, do hereby certify that the foregoing pages numbered from 1 to 146 inclusive contain full, true and correct copies of Complaint; Portion of Motion for More Definite Statement or for Bill of Particulars; Plaintiffs' Bill of Particulars; Plaintiffs' Bill of Particulars in Response to Specification 4; Order to Inspect; Answer; Interrogatories Propounded by Plaintiffs etc.; Defendant's Answers to Plaintiffs' Interrogatories; Defendant's Additional and Amplified Answer to Plaintiffs' Interrogatories; Further Answers to Plaintiffs' Interrogatories; Further Amended and Supplemental Complaint; First and Amended Answer of Natural Carbonic Products, Inc., et al to Further Amended Complaint, except portions relating to Counterclaim; First Answer of George Pepperdine Foundation to Further Amended and Supplemental Complaint, except portions relating to Counterclaim; Stipulation re Patents; Notice to Plaintiffs re Corrections to Answers to Plaintiffs' Interrogatories; Two Notices to Plaintiffs by Defendants re Prior Art to be Relied Upon; Affidavit of C. A. Miketta; Order; Notice of Taking Depositions on Behalf of Defendants; Minute Order Entered July 15, 1944; Findings of Fact and Conclusions of Law; Judgment and Decree Dismissing Further Amended and Supplemental Complaint on the Merits and Dismissing Counterclaims with Costs to Defendants; Motion for Sub-

stitution of Party Plaintiff; Order for Substitution; Notice of Appeal; Concise Statement of Points on Appeal; Cost Bond on Appeal; Bond on Appeal Superseding Judgment for Costs; Order; Two Stipulations and Orders Extending Time for Docketing Appeal; Designation of Contents of Record on Appeal; Counter-Designation of Additional Portions of Record, Proceedings and Evidence on Appeal and Stipulation and Order re Record on Appeal which, together with Reporter's Transcript of Decision of the Court, copy of Reporter's Transcript, Original Plaintiff's Exhibits 1 to 8, inclusive, 11, 14, 15, 17 to 28 inclusive and 31 to 65 inclusive, Original Defendants' Exhibits A to U, inclusive, DD to VV, inclusive, transmitted herewith, constitute the record on appeal to the United States Circuit Court of Appeals for the Ninth Circuit.

I further certify that my fees for preparing, comparing, correcting and certifying the foregoing record amount to \$25.55 which sum has been paid to me by appellant.

Witness my hand and the seal of said District Court this 7th day of May, 1945.

EDMUND L. SMITH,

[Seal]

Clerk

By THEODORE HOCKE

Chief Deputy Clerk.

[Title of District Court and Cause.]

Hon. Ralph E. Jenney, Judge Presiding.

REPORTER'S TRANSCRIPT OF TESTIMONY  
AND PROCEEDINGS ON TRIAL

Appearances:

Lyon & Lyon, by  
L. S. Lyon, Esq., and  
R. E. Caughey, Esq.  
Hugh M. Morris, Esq.  
Allen E. Peck, Esq.,

For Plaintiffs.

Harris, Kietch, Foster & Harris, by  
Ward D. Foster, Esq.,

For Defendant George Pepperdine Foundation.

Casimir A. Miketta, Esq.,

For Remaining Defendants.

Mr. Morris: \* \* \* [4\*]

\* \* \* \* \*

At the time Cole and McLaren began their work resulting in the patent in suit carbon dioxide had been liquefied. It had been solidified. Both the liquid and the solid had been and were being commercially made and sold. Solidification was effected in one apparatus. Pressing the light highly [6] porous product into blocks for transportation and use was carried out in another apparatus. [7]

\* \* \* \* \*

Mr. Miketta: \* \* \* [29]

\* \* \* \* \*

And I would like to call your Honor's [30] attention specifically to claim 33, and if you do not mind, I will illustrate it on the blackboard as we go along.

The preamble reads: "In a gas solidifying and pressing apparatus,"—now, that is just a very general statement of what it is supposed to be. The first element—we can forget about words and look for the elements, because those are the things that define a structure in a machine. "a solidifying and pressing chamber having one end thereof open,"—all right. Let us draw a chamber (diagramming on blackboard) and that may represent the cross-section of a chamber having one open end. The top end is open.

The next element referred to in the claim is: "a closure head movable to close the open end of said chamber and to seal the chamber from the atmosphere,"—very well. We can draw in yellow now a closure head as defined in that claim, which, as stated in the claim, is to seal the chamber from the atmosphere. We now have, you may say, a section of a bottom. It has a bottom; it has sides; and it has this movable closure. It is supposed to be movable because the claim so states.

And the next element referred to in the claim, I quote: "means for moving said closure head to and from chamber closing position and for maintaining said head in chamber closing position against pressures within the chamber,"— Well, now, "means for moving" may be any means. We can illustrate that by, let us say, a rod and up above that we [31] have some sort of hydraulic means for moving it up and down. It could be a rack and pinion. As a matter of fact, I think it could be just a pair of hands, if the pressures are not high enough. You could have various means.

Then the claim reads: "a pressing plunger reciprocal in said chamber for pressing a mass of solidified gas in the chamber into a block against said closure head while the latter is held in chamber closing position by said means,"—now, let us draw this pressing plunger inside the chamber, and I will draw it in green. All right. And that can be moved toward and away from that closure head.

"Said plunger"—this is what the claim says—"said plunger formed for passage of gas therepast as the plunger is moved in the chamber,"—very well. In order to live up to that requirement we can say that that plunger is loose in there so that it moves up and the gas can get around it.

Then the claim continues by stating: "means for forcing said plunger into block pressing engagement with a mass of solidified gas in the chamber,"—well, in order to do that I am going to make a hole in the bottom of this now, the bottom of the chamber, and put in a gasket there or any suitable gland; and I will draw a bottom plunger through that hole and attach to the bottom of that ram or rod some means, as a hydraulic cylinder. So that we have "means for forcing said plunger into block pressing engagement with a mass of solidified gas in the chamber." [32]

We can assume that this mechanism now will raise that plunger against whatever is in this chamber toward the closure head.

Then the claim finally states: "and said closure head being movable to position opening the end of the chamber upon completion of the block pressing for removal of the block through the chamber open end."

Well, that is a statement of the function or result that cannot even be illustrated. [33]



\*       \*       \*       \*       \*       \*       \*       \*

Mr. Miketta: \*   \*   \*   [50]

\*       \*       \*       \*       \*       \*       \*       \*

Let us go to the other extreme. The most detailed claim of the claims that this patent has,—there are two claims, 34 and 36, including all of the elements. Let us picturize claim 36.

Claim 36 starts out in stating:

“In gas solidifying and pressing apparatus;”

That is the preamble. Then it continues: [51]

“a gas solidifying and pressing chamber having one end thereof open,”

Which I will again draw; a chamber with an open end. Then the claim states:

“a closure head movable between position closing the opening end of the chamber to seal the chamber from atmosphere,”

We will put a closure element or lid on that chamber, and that is movable.

“between position closing the open end of the chamber to seal the chamber from atmosphere, and position removed from and opening the chamber end for discharge of material therefrom,”

I will not indicate it in the open position. The third element is:

“Means for moving said closure head between chamber opening and closing positions and for maintaining the head under sufficient pressure when in closed position to overcome pressures within the chamber acting to force the head to open position,”

All those words simply mean we have something here again which raises and lowers that lid. Then the next item in claim 36 is:

“a pressing plunger reciprocal in the chamber”

I will indicate that with green.

“toward and from said closure head and in normal inactive [52] position disposed in the chamber spaced from said head,”

So I will draw it in the bottom part of this chamber. That is the normal position of it. It is in an inactive position. Then the claim continues:

“means for supplying a compressed gas to said chamber when the closure head is in chamber closing position and the pressing plunger is in normal inactive position to convert a portion of said gas into solidified form in the chamber between the plunger and pressing head,”

Well, all that means, again, is that we will put in an inlet in here somewhere in the wall of the chamber, put a hole and put in a pipe, and that is our inlet. For what? The claim says “a compressed gas.” It does not say “a liquid gas”—“a compressed gas.” A compressed air would answer that description.

Then the claim reads: “means for withdrawing the unsolidified gas from the chamber during formation of the solidified gas therein,”—means for withdrawing. Very well, we will put in another hole in the wall and we will hook that up with the pipe; and now we have an outlet pipe for whatever gas is in the chamber.

The claim then continues: “and means for forcing said pressing plunger toward a mass of solidified gas to press such mass into a block against the closure head,”—

it does not identify what type of means that should be. It can be almost anything from a lever to hydraulic means; but since [53] practical machines are hydraulic, we will just put a piston rod down there and indicate that there is a hydraulic cylinder there.

Then the last clause reads: "said closure head being movable after completion of the block pressing by said plunger to position removed from the chamber for unobstructed removal of the block from the chamber." Now, that is just a functional statement. So, stripping it of all its verbiage, we find that claim 36 is, as I say, the most limited claim, or the one that includes all of the so-called elements is nothing, again, but a press with an inlet and an outlet. All of those elements are individually old—an outlet, an inlet—the plaintiffs have admitted that.

And let us see how close the prior art approximates this particular structure. If your Honor will refer to the book of patents, and particularly to patent 1,288,255, issued to Stastney in 1918, and particularly look at Fig. 1, your Honor will see that in that patent there is described the same combination of elements. In the first place we have a chamber, which in this case has hollow walls indicated by the numerals 6 and 7. So that may I just add in here a little outside hollow wall in white crayon? [54]

\*   \*   \*   \*   \*   \*   \*   \*   \*

The Court: \* \* \* Let us get down to the proof here, and go ahead and call your witnesses.

Mr. Morris: May I put in one or two exhibits?

The Court: Yes, certainly. I did not mean in the sense of persons.

Mr. Morris: The first is a stipulation as to using uncertified copies, and so forth, usually mentioned in a

case of this kind. Is it your Honor's practice to read it into the record, or shall I merely deliver the copy, as Exhibit 1? [175]

\* \* \* \* \*

The Court: It already has been filed, as a matter of fact. I think it had better be admitted in evidence.

Mr. Morris: Then I offer the filed copy as Plaintiffs' Exhibit No. 1.

[Note: Plaintiff's Exhibit No. 1 will be found in the Book of Exhibits at page 1315.]

The Court: So admitted. You may take the copy, Mr. Clerk.

Mr. Morris: As Plaintiffs' exhibit I next offer into evidence the patent in suit, No. 2,025,698. I have a copy which I hand to your Honor. That is the exhibit.

The Court: Let it be marked as an exhibit.

Mr. Morris: I have a certified copy. May I offer that in evidence?

The Court: Yes. It may be received as Plaintiffs' Exhibit No. 2. [177]

[Note: Plaintiff's Exhibit No. 2 will be found in the Book of Exhibits at page 1317.]

\* \* \* \* \*

Mr. Miketta: If the court please, I see no necessity of burdening the record with a great many exhibits, in view of the fact that we have admitted the genuineness of the certificate of incorporation of the International Carbonic Engineering Company and have also admitted the fact that it was properly incorporated, and the certificate of the Secretary of State of the State of Delaware.

I think we can stipulate on the record, for example, that there was an assignment on July 20, 1941, assigning the application for the patent in suit, serial 279,641, signed by Harry W. Cole, and Malcolm W. McLaren, dated July 20, 1941, whereby that application was assigned to the Carbonic Equipment Corporation.

I will also stipulate that by assignment signed by the Carbonic Equipment Corporation, on May 4, 1934, by \_\_\_\_\_ as president, and W. W. White, secretary, acknowledged September 17, 1935, application serial number 279,641, was assigned to International Carbonic Engineering Company, a Delaware corporation, and I will also stipulate that by an agreement of merger and consolidation—

Mr. Morris: I am not offering that.

Mr. Miketta: Very well. So far as title is concerned, [185] I am willing to stipulate to it, your Honor.

The Court: The stipulation will be received. Is that satisfactory, Mr. Morris?

Mr. Morris: Yes, your Honor, but may I make this statement: That the form of stipulation submitted to learned counsel last week was that:

1. Plaintiff, International Carbonic Engineering Company, was incorporated under the laws of the State of Delaware in 1920, and still is a corporation created by and existing under the laws of said state.

The Court: I understand you stipulated to that?

Mr. Miketta: I stipulated to that, your Honor. I received that stipulation after I had acknowledged the genuineness of many of these documents. Frankly, I do not see any necessity of the additional stipulation.

Mr. Morris: 2. The plaintiff, International Carbonic, Inc., was organized under the laws of the State of



Delaware on or about June 25, 1940, and still is a corporation created by and existing under the laws of said state.

The Court: May it be so stipulated?

Mr. Miketta: Yes.

Mr. Morris: 3. National Carbonic Products, Inc., was organized under the laws of the State of California on or about the 25th of January, 1940.

The Court: May it be so stipulated?

Mr. Miketta: I stipulate to that, your Honor. [186]

Mr. Morris: No. 4 was: Plaintiff, International Carbonic Engineering Company has legal title to the patent in suit, No. 2,025,698.

Mr. Miketta: I think that is covered by assignment, your Honor. We have already stipulated that by assignment they have acquired the right, title and interest to the patent.

The Court: I think that is true. However, may it be so stipulated, to keep the record?

Mr. Miketta: Yes. [187]

\* \* \* \* \*

Mr. Morris: \* \* \* I am offering interrogatory No. (1): "Was defendant using at its plant near Niland, Imperial County, State of California, at the time the complaint herein was filed, the three presses in which carbon dioxide snow is compressed into blocks, referred to in Paragraph VI of defendants' answer?"

The answer of May 29, 1943, was:

"Prior to the filing of the complaint herein defendant had used the three presses referred to in Paragraph VI of [188] defendant's answer; but at the time the complaint was filed defendant was not using the two Frick presses."

“(2) If the answer to Interrogatory (1) is in the affirmative, was each of the said three presses then being used:

The answer of November 6, 1942, was:

“On October 21, 1941, the H. P. M. press was being used in the performance of its inherent function. The two Frick presses were not in operation.”

“(3) For what length of time immediately prior to the time of the filing of the complaint herein, had each of the said three presses been used by defendant at its plant near Niland, Imperial County, State of California, or elsewhere?”

The answer of May 29, 1943, the first two sentences:

“Prior to the tile of the filing of the complaint, defendant had used, at its plant near Niland, each of the three presses. The presses were not used continuously.”

I pause there to note that it is admitted that defendant was incorporated under the laws of this state in 1940, so that any use that was made was within less than two years prior to the filing of the complaint.

“(5) Has defendant used said three presses or any thereof since the filing of the complaint herein?”

The answer of March 25, 1943:

“In answer to plaintiffs’ Interrogatory 5 is ‘Yes.’”  
[189]

“(6) If defendant has used, since the filing of the complaint herein, less than all of said presses, state which presses have been so used and the time or times of the use of each.”

The answer of March 25, 1943, was:

"In answer to plaintiffs' Interrogatory 6, defendant states that three presses have been used intermittently and at various times."

"(7) Which of said three presses has a compressing chamber?"

The answer of November 6, 1942:

"7-40. In response to Interrogatories 7 to 40, affiant attaches hereto Exhibits 9 and 10. Certain of the interrogatories are amplified hereafter.

"(Exhibits 9 and 10 attached to defendant's answer of November 6, 1942.)"

There are certain admissions in the discussions which took place before your Honor on various motions, and there was a hearing on April 12, 1943, lines 22-24, page 6, of the Reporter's Transcript of that hearing and shows as follows:

"The Court: He asks 'Which of the three presses has a compressing chamber?' and the answer is, 'All of them.'

"Mr. Miketta: That is correct."

"(9) Which of said compressing chambers is openable at one end to permit the removal or ejection of the carbon dioxide solidified and compressed therein?" [190]

Lines 18-26, page 7, and lines 1-4, page 8, of Reporter's Transcript of Hearing April 12, 1943, is:

"The Court: \* \* \* 'Which of said compressing chambers is openable at one end to permit the removal or ejection of the carbon dioxide solidified and compressed therein?'

"Well, I think he is entitled to know that.

"Mr. Miketta: All of them, your Honor, in that instance, they all open because you have to get the stuff out.

"The Court: All of them open in one form or another.

"Mr. Miketta: You have to get the material out.

"The Court: You open it with screws or something and the answer to that is, 'All of them.'

"Mr. Miketta: That is correct, your Honor.

"The Court: And I think you should answer it. That will be granted as to 9."

And the answer of November 6, 1942, was:

"(Exhibits 9 and 10 attached to defendant's answer of November 6, 1942.)"

The answer of May 29, 1943, was:

"Each of the presses includes a wall forming a cylinder or chamber in which carbon dioxide snow is collected and compressed into a block; it is assumed that the interrogatories refer to this wall forming the cylinder as 'Compressing chamber.' In the light of such definition the answer to Interrogatory 9 is,—'All of them.'" [191]

"(13) In which of said chambers is the compressing means adapted to eject the compressed carbon dioxide after the carbon dioxide therein has been compressed or compacted?"

Answer of November 6, '42:

"Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

Answer of May 29, '43, is:

"To the best of our knowledge and understanding of this interrogatory,—all of them."

“(14) Which of said chambers has connected or associated therewith, means or apparatus for supplying thereto liquefied carbon dioxide for expansion to produce in the chamber an accumulation of solidified carbon dioxide?”

Answer of November 6, '42:

“(Exhibits 9 and 10 attached to defendant's answer of November 6, '42.)”

The answer to interrogatory 14 made on May 29, '43, is this:

“This interrogatory, as revised by the Court, reads: ‘Into which of said chambers may liquefied carbon dioxide be injected?’ The answer is,—all of them.”

“(15) In which of said chambers is the carbon dioxide compressed, against a movable head of the chamber, by a ram or plunger?”

Answer of November 6, '42, is:

“Exhibits 9 and 10 attached to defendant's answer of November 6, '42.” [192]

The answer of May 29, 1943, is: “All of them.”

“(16) With respect to which of said chambers is the means for opening and closing the movable head of the chamber hydraulically operated?”

Answer of November 6, '42, is: “Exhibits 9 and 10 attached to defendant's answer of November 6, '42.”

The answer of May 29, '43, to interrogatory 16 is this: “If the term ‘hydraulic’ refers to both water and oil, the answer is,—all of them.

“(17) With respect to which of said chambers is the ram or plunger for compressing the solidified gas hydraulically operated?”



The answer of November 6, '43, was: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

The Court: When you engineers talk about a thing being "hydraulically operated" you simply mean it is operated by some fluid or liquid, it doesn't make any difference what it is; is that true? It may be oil, it may be water, it may be—

\*      \*      \*      \*      \*      \*      \*      \*      \*

The Court: —milk.

\*      \*      \*      \*      \*      \*      \*      \*      \*

Mr. Morris: Mr. Jones tells me our answer is "Yes."

\*      \*      \*      \*      \*      \*      \*      \*      \*

Mr. Morris: "(17) With respect to which of said chambers [193] is the ram or plunger for compressing the solidified gas hydraulically operated?"

And the ultimate answer was: "All of them."

18, I think—I was about to say that I think you will find the answers to 18 and 19 very interesting. But your Honor is following very closely and I withdraw my intended remark.

"(18) Which if said chambers has connected or associated therewith apparatus or means for controlling the gas pressure in said chamber?"

Answer of November 6, '43: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42.

"With respect to Interrogatories 18 and 19, defendant can not truthfully answer these interrogatories since the scope or meaning of 'controlling the gas pressure' is not known. Defendant states that a plug cock or valve is in

the so-called blow-back line leading from the press to the compressor, but this is not set to give a definite, predetermined or controlled pressure in the press nor in the blow-back in line and that the pressure in the press and blow-back line varies from atmospheric or 0 pounds gage to about 80 pounds gage pressure."

Your Honor. I take it, understands what is meant by "gage pressure." That registers, as I understand it, at the pressure above atmospheric.

The Court: I assumed that that was what was meant by it. [194] But never take it for granted that I understand anything.

Mr. Morris: Well, I had to inquire even then, your Honor, whether my understanding was correct.

Answer of May 29, '43, as to 18 and 19 is this:

"Defendant can not truthfully answer these interrogatories as phrased since the meaning and scope of the term 'controlling the gas pressure in said chamber' is not understood and no particular stage of the operations is referred to. Defendant states that no automatic means are employed for maintaining any pre-determined pressure in the chambers, as stated in defendant's Exhibit 9 and 10. There is a blow-back line connected to each chamber and a manually operated valve in each blowback line, as shown by defendant's Exhibits 9 and 10, such blowback lines running back to a compressor. Upper and lower platens or rams assist in closing the ends of the chambers and thereby cause pressure to build up in the space enclosed by the chambers when liquid CO<sub>2</sub> is admitted into each chamber. Lower platen of H. P. M. press is slightly lowered at end of snow forming to let out some additional gas and is kept in such slightly lowered posi-

tion during pressing. Upper ram of Frick presses is slightly raised to let out some additional gas and kept in such slightly raised position while pressing upwardly with lower ram."

The Court: As I understand, the effect is the same; it is just done in two different places. [195]

Mr. Miketta: That is right, your Honor. You can either move the two of them or you can just move one as specified in the patent.

The Court: All right.

Mr. Morris: "(19) Describe, and illustrate by a drawing or drawings, the means or apparatus for controlling the gas pressure in said chamber and the relationship, connection, or association of such apparatus with said chamber."

I offer into evidence the exhibits 9 and 10 annexed to defendant's answer to the interrogatories; and I ask that Exhibit No. 9 be marked Plaintiffs' Exhibit 3, and Exhibit No. 10 be marked Plaintiffs' Exhibit No. 4, omitting from Exhibit 9 General Note 4 which says: "Upper ram open during press period." The answer which I just read shows what that opening was. That is vague and indefinite. And omitting from the H. P. M. press drawing general note No. 3: "Open chamber while pressing." Those notes I do not offer.

Mr. Miketta: Your Honor, I object to the introduction of modified or altered documents. They either should be offered into evidence in their original form, and they should not be altered. The exhibit was complete when introduced.

The Court: No; I don't think that principle of evidence is sound. I think he may do it with a document originating with you. Later, if you deem it is pertinent, you may ask [196] that they be admitted. I may be a little more strict than most Judges. I always like to have each fellow put in his case as he thinks best, and then let the other man supplement it with what he wants. In that way we do not get into this complication.

It may be admitted with those deletions.

[Note: Plaintiff's Exhibit No. 3 will be found in the Book of Exhibits at page 1327.]

[Note: Plaintiff's Exhibit No. 4 will be found in the Book of Exhibits at page 1328.]

Mr. Morris: May I explain?

The Court: I understand; I understand. You explained it in your opening statement.

Mr. Morris: The statement is at the end of the answer to interrogatories 18 and 19. That is the reason that I mean, with the sentence beginning "Lower platen of H. P. M. press is slightly lowered," etc., while you would not know from the general note on our present Exhibits 3 and 4 whether wide open, halfway open, that explains it.

The Court: I would not have understood it if you had not explained your position in your opening statement. I think I can grasp it.

Mr. Morris: Very well.

Answer to (19) under November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

Answer of May 29, '43: "See answer under Interrogatory 18."

(18) A similar answer of May 29, '43.

Interrogatory 20: "What pressure is maintained by defendant in each of said chambers, [197]

"(a) during the time that liquefied carbon dioxide is being supplied to the said chambers, and

"(b) during the period, if any, intervening between the time the supply of liquefied carbon dioxide to the chamber is shut off and the completion of the solidification of the carbon dioxide?"

The answer of May 29, '43, is: "No predetermined pressure schedule is maintained by defendant and pressures vary with operator on the job, temperatures of air, whether presses have been working immediately prior or not, etc.

"(a)—To the best of our knowledge, pressure in each chamber rises from 0 pounds gauge to between 62 and 72 pounds gauge (occasionally going to 80 pounds gauge) during the time that liquid carbon dioxide is being admitted into chambers." [198]

\*       \*       \*       \*       \*       \*       \*       \*

Mr. Morris: I had finished reading paragraph (a) of the answer of May 29, '43, to interrogatory (20) before the recess.

(b) of that answer differs somewhat from the under-[201] standing of the learned counsel for defendants with respect to defendants' operation.

Paragraph (b) begins: "Defendant does not understand this interrogatory but volunteers the following: After the valve admitting liquid carbon dioxide is shut off



manually, the pressure in the chamber starts dropping and when pressure is down to between 10 pounds and 25 pounds gauge, the blowback line is manually opened to the atmosphere"—that is, the blowback line is immediately open to the atmosphere—" (instead of to the compressor.)"—

The Court: Mr. Miketta, as I understood you, you did not actually open the blowback line, but you opened another aperture to the atmosphere and kept the blowback line closed.

Mr. Miketta: May I draw a little sketch here to show the equivalency of that?

(Diagramming on blackboard). Here is the wall, we will say, of the chamber, and here is the so-called blowback line that goes to the compressor or back to the system. Now, that is open all the time. Here I have indicated a separate line to the atmosphere.

The Court: Correct.

Mr. Miketta: Suppose we were to do that (diagramming), then this is open all the time, while, let us say, that is closed; and that is what happens when nature takes its course and snow forms here. That gas goes to the rest of the system. After that pressure has dropped down, as I said, [202] to somewhere around 5 to 10 pounds, that is closed and this is opened to the air.

Now, here I have indicated two separate openings. Here you have two separate openings but they connect to the same chamber, you see.

The Court: The principle is the same.

Mr. Miketta: The principle is exactly the same, your Honor. This is simpler, perhaps, than manipulating two

valves. That is why I indicated it that way here. But the answer is the same.

The Court: All right. Now, let me see if I understand it. I have to understand these things as I go along. You have a valve on the conduit that brings material into the chamber, and you have a valve on the conduit that takes the gases that are not immediately being used in the process of solidification and that goes back to your compressors or your storage tanks or whatnot. It is to be used again.

Mr. Miketta: That is correct.

The Court: At the time that the injection of the  $\text{CO}_2$  is taking place, you do not attempt to control the outlet; you just let nature take its course; it goes out as it wishes.

Mr. Miketta: That is correct.

The Court: When the man who is operating the device feels that the solidification process has proceeded far enough, he closes, first, the inlet valve, then he closes the outlet valve and he opens the valve which does not carry the excess [203] gases to the compressors or storage chamber but just disposes of it in the atmosphere.

Mr. Miketta: That is correct, your Honor.

The Court: There is no attempt at automatic control so far as this process is concerned.

Mr. Miketta: None at all.

The Court: Very well.

Mr. Morris: To finish the answer to paragraph (b) of interrogatory 20: "the blowback line is manually operated to the atmosphere (instead of to the compressor) to permit the remaining gas in chambers to blow off to the atmosphere."

I assume that that means the gases over and above the atmospheric pressure. I do not assume that he is creating a vacuum in there by opening that to the atmosphere. "Platens and rams are then manually operated as stated in answer to Interrogatory 19. Defendant does not know what pressure exists in the snow while it is being compressed into a block."

The Court: Suppose that you rub out those two green lines below the outlet conduit, as not being accurate. It might be confusing.

Mr. Miketta: All right, sir.

The Court: Mark your upper diagram "A", your middle one "B", and your lower one "C", and then we can keep track of them. Will you reproduce those on sheets of paper and mark them the next exhibits for identification, so that they will [204] be in the record here?

Mr. Miketta: Very well, sir.

The Court: We have been refering to them and we might as well have them in the record.

Mr. Morris: May I make an inquiry? I don't know whether counsel will want to answer it or not.

The Court: Well, ask them.

Mr. Morris: My understanding of the explanation of diagram C was that the valve in the blowback line is always closed when the valve in the branch to atmosphere is open.

Mr. Miketta: You are asking me about something, Mr. Morris, that takes place within the matter of seconds, and whether the operator closes one valve before he opens the other, or vice versa, it is almost a simultaneous operation as I have observed it. May I check that with the diagram that I drew?

Mr. Morris: Yes. I will proceed while you are doing that and you may tell me that later.

Mr. Miketta: I think you are absolutely correct, that this valve is closed before that one is opened.

Mr. Morris: "This valve" referring to the blowback line and "that one" to the branch to the atmosphere.

Very well, 21.

Mr. Miketta: I will do that later.

Mr. Morris: "(21) Is all of the liquefied carbon dioxide supplied to the chamber of any of said presses [205] converted therein into a solid? Or is part of the liquefied gas supplied to the chamber in each of said presses converted into a solid and the remaining portion of the liquefied gas converted into gaseous form?"

The answer of May 29, '43, is: "The answer to the first part of this interrogatory is in the negative; to the second part, in the affirmative.

"(22) Which of said chambers has connected thereto or associated therewith a conduit or pipe, or conduits or pipes, through which the portion of the liquefied gas supplied to the chamber that is therein converted into a gas, passes from said chamber?"

The answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

The answer of May 29, '43, is: "All of them."

The Court: Did that question mean the chambers in the three devices?

Mr. Morris: Yes, your Honor; in the three devices. Yes.

The Court: Yes.

Mr. Morris: "(24) In which of said chambers is the plunger or ram movable to press an accumulated mass of solidified gas into a block?"

Answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

And the answer of May 29, '43, is: "All of them."

"(27) In which of said chambers is said plunger normally [206] inactive during expansion of the liquefied gas and the accumulation of the solidified gas in the chamber?"

Answer of May 29, '43, is: "All of them."

"(28) Which of said chambers has connected or associated therewith means or apparatus for maintaining the movable head or closure member in chamber-sealing position, against opening under the action of pressures within the chamber?"

Answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

Answer of May 29, '43, is: "All of the chambers have a ram or platen associated therewith which will resist opening under the action of pressure within the chamber."

"(31) Which of said chambers is, during operation, vertically disposed?"

Answer of May 29, '43, is: "All of them."

"(33) Which of said chambers has a vertically disposed fluid pressure cylinder below it?"

Answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

And the answer of May 29, '43, is: "All of them."

"(34) Which of said cylinders has a vertically reciprocal plunger therein?"



Answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

And the answer of May 29, '43, is: "All of them."

"(35) Which of said cylinders has a chamber-closing head [207] mounted on the end of such pressure cylinder and vertically movable therewith between position closing an end of the chamber and a position opening an end of the chamber?"

Answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

The answer of May 29, '43, is: "All of them."

The Court: May I ask you, when you ask the question 33: "Which of said chambers has a vertically disposed fluid pressure cylinder below it?" you just mean the hydraulic chamber below?

Mr. Morris: The hydraulic apparatus, the hydraulic apparatus; that is right.

"(37) In which of said chambers is there a pressing plunger movable toward and from the closing head and in normally inactive position located in the chamber spaced from the closing head?"

Answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

The answer of May 29, '43, is: "This interrogatory is ambiguous. Defendant, interpreting this interrogatory very broadly, states, in answer thereto,—all of them."

The Court: All you mean is that, assuming that the closure is there and it is in a fixed position, temporarily, anyway, which one of them has some type of pressing plunger that compresses the material between the two, is that it?

Mr. Morris: All it means is that the plunger is [208] stationary during the operation, during the snowing or the solidifying operation, that is, there is a pressing plunger that is movable toward and from the closing head but is not movable in normally inactive position, located in the chamber spaced from the closing head. In other words, if your Honor will look at, say, one of the drawings, you will see in all of them, for instance, when that upper platen is in a stationery position at the top—

The Court: Yes.

Mr. Morris: And here the lower ram is in stationary position at the bottom, and that is spaced from the closing head in each instance, and we say: Is that your normal operation? That plunger is movable toward and from the closing head and in normally inactive position located in the chamber spaced from the closing head.

The Court: Of course, this question is not very clear. What do you mean by “normally”? Naturally, there are times when that pressing plunger is active. When the material is being formed it would be inactive.

Mr. Morris: That is right.

The Court: That is what you meant by the question?

Mr. Morris: That is what I meant.

The Court: Is that what you meant by the answer?

Mr. Miketta: Well, I guessed that that is what he was driving at, your Honor, and I think I answered it correctly. In other words, in inactive position the plunger is down at [209] the bottom spaced from the top. Frankly, it was a little ambiguous to me.

The Court: I wanted to be sure I understood. I did not think there was any question about it.

Mr. Morris: The answer of the learned counsel that the plunger is at the bottom means that he is referring to the two presses where the discharge opening is at the top?

Mr. Miketta: That is correct, Drawings A and B.

Mr. Morris: "(38) Which of said chambers has a means connected or associated therewith for supplying liquefied carbon dioxide to the chamber with the closing head in closed position and the pressing plunger in inactive position spaced from the closing head?"

That is a clarification, I take it, of (38).

The Court: That is right.

Mr. Morris: The answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

The answer of May 29, '43, is: "All of them."

Interrogatory "(39) Which is said chambers has associated therewith a closing head movable from chamber-closing position to a position spaced from the chamber, for unobstructed removal of a block of solid carbon dioxide from the chamber?"

Answer of November 6, '42, is: "Exhibits 9 and 10 attached to defendant's answer of November 6, '42."

The answer of May 29, '43, is: "All of them."

Will Dr. Jones take the stand, please? [210]

CHARLES L. JONES,

called as a witness on behalf of plaintiffs, being first duly sworn, testified as follows:

The Clerk: State your name, please.

A. Charles L. Jones.

Direct Examination

Mr. Morris: I am calling Dr. Jones not only as an expert—I shall probably ask him some questions as an expert, and calling him largely as a fact witness. I thought your Honor would be interested in knowing that before I begin, because it will answer some questions that would otherwise arise in your Honor's mind.

Q. Dr. Jones, would you be good enough to tell us your full name? A. Charles L. Jones.

Q. And your residence?

A. Edgewood, Pennsylvania.

Q. And your age? A. 48.

Q. The schools that you attended after high school?

A. The Allegheny College, University of Pittsburgh.

Q. And your occupations since that time?

A. Since that time I have been employed as a chemist and chemical engineer at Mellon Institute of Industrial Research; with the Dry Ice Corporation of America and its successor companies. [211]

I don't know if it is necessary to go into complete record as to dates.

Q. I called you "Dr. Jones." Was that an honorary title or was that one that you earned?

A. No; earned in the course of University of Pittsburgh, 1923.

Q. In what course was it given to you?

A. In chemical engineering.

(Testimony of Charles L. Jones)

Q. Dr. Jones, what did you do at the Mellon Institute? What was your occupation there?

A. Well, the occupation of principal interest in this case was that in 1922 The Compressed Gas Manufacturers Association—in passing, I call your attention to the name of the association—"The Compressed Gas Manufacturers Association," who were manufacturers of liquefied carbon dioxide, came to Mellon Institute and employed me to investigate possible uses for their product to try to find some way of expanding their markets for carbon dioxide. [212]

\* \* \* \* \*

A. (Continuing) In the course of this investigation of the uses for carbon dioxide we had occasion to investigate the properties of the material; and it was also suggested at the time, that these manufacturers might undertake to solidify some of their product and sell it for refrigeration. They did not, however, enter any such activity at the time and, in fact, the solid carbon dioxide industry was independently developed by others.

Following the connection with the solid carbon dioxide industry, I left that industry in 1934 and am at present in the steel business with the Firth-Sterling Steel Company.

Q. By Mr. Morris: Did you state the date that you went with the solid carbon dioxide industry?

A. I did not.

Q. Can you fix it approximately?

A. I was connected with it for approximately one year as a consultant in 1927; and then in 1928, until 1934, as chief engineer of Dry Ice Corporation.



(Testimony of Charles L. Jones)

Q. By the Court: What year were you speaking of when you were with the Mellon Institute and they wanted to expand their market?

A. The Mellon Institute work on carbon dioxide was started in 1922 and completed in 1924.

Q. By Mr. Morris: So that during that period, which was a three-year interval, between 1924 and 1927, you were not [213] directly engaged in connection with the business? A. That is correct. [214]

\* \* \* \* \*

Q. By Mr. Morris: After you became associated with the Dry Ice Company of America did you become familiar with the apparatus that was being used for making solidified carbon dioxide generally? A. I did.

Q. Was or was not that apparatus so being used the same, or substantially the same, or different, from that being used by the Dry Ice Company of America in the plant in which you [215] were immediately engaged?

A. So far as my information goes, they were the only producers at the time, of which the Dry Ice Corporation was the principal one. I would say, therefore, that this method was the most widely used method in the industry at the time.

Q. That method was the snow tank method that you have referred to? A. It was.

Q. I hand you a photostatic copy of a photograph, and ask you if you know when that photograph was taken. His Honor has the original. There is a notation on the back of it. Can you tell me when it was taken?

A. I cannot, as to the exact date, no. It was taken in the Maspeth plant of the Liquid Carbice Company.

(Testimony of Charles L. Jones)

It bears the notation 1927, which was made at the time. The photograph has been in my possession ever since.

Q. Does that truly portray, in so far as it does portray, the apparatus in this patent?

A. I would say that is a typical installation of that kind of equipment, yes.

Mr. Morris: I offer it in evidence.

The Court: It may be received.

[Note: Plaintiff's Exhibit No. 5 will be found in the Book of Exhibits at page 1329.]

Mr. Miketta: I object upon the ground that the plant has not been identified yet, and the location.

A. Long Island.

Mr. Miketta: No foundation has been laid. [216]

A. Maspeth, Long Island, New York.

Mr. Morris: I think the witness had answered that.

The Court: Let me ask you one further question. You said at this time, of which you spoke, 1927, there were only two producers, of which this company was one?

A. Yes.

The Court: Did the other company use substantially the same type of apparatus?

A. I can't testify as of my own knowledge as to that particular time. However, I should say that they did not. To the best of my information they used an apparatus, at about that time, which was developed by the plaintiffs in this case, or by Cole and McLaren, rather, who were not then connected in any way with the Dry Ice Company.

(Testimony of Charles L. Jones)

Q. My Mr. Morris: You are referring to what corporation?

A. I believe it was known as the Carbice Corporation. That was our principal competitor at the time.

Q. Dr. Jones, will you be good enough to explain, please, by that schematic drawing, which I hand you, the operation in the plant in which you were engaged?

Mr. Foster: That is objected to, your Honor, unless the time is specified.

The Court: Objection sustained.

Q. By Mr. Morris: At the time you have described, as approximately the time that that photograph was taken.

Mr. Foster: That is objected to still as indefinite.  
[217]

The Court: I think that is sufficient, unless it is shown that a year or two or three makes a particular difference. That can be brought out on cross examination. I think you may answer.

A. May I say that the method in question was already in use when I first had any connection with the industry, and although displaced by other methods, it continued in use to a greater or less extent for at least five years thereafter.

Q. By Mr. Morris: That is, up to about 1932?

A. Yes, sir.

Q. Or the end of 1932? A. Yes, sir.

Q. What part of 1932?

A. It doesn't make any difference. The end of the producing season, I would say.

Mr. Morris: I renew my offer; or is it admitted?

The Court: It is admitted.

(Testimony of Charles L. Jones)

Q. By Mr. Morris: Then will you please, Dr. Jones, proceed to tell me what this schematic drawing depicts or represents?

The Court: I would like to know what a schematic drawing is. That is something new to me.

Mr. Morris: I withdraw my question, and I will ask you what a schematic drawing is.

A. A schematic drawing, I would say, is a symbolic representation of the process, rather than an accurate [218] detailed drawing, such, for instance, where a valve is shown, and indicates, as for example, the liquid CO<sub>2</sub> is shown on the drawing, and it does not appear to be coming from anywhere. It may be a word invented to take advantage of possible omissions in descriptions and in drawings for court work.

Q. Could it mean this, Dr. Jones, that in an art or an industry, as for example, agreed upon by long usage, or otherwise, certain symbols are indicated to mean certain things?

Mr. Miketta: I object to that as assuming something not in evidence.

Mr. Morris: Question withdrawn, and I will ask you to answer the question I asked a while ago.

A. The drawing in evidence shows a snow tank, indicated in outline form on the righthand side. This is a fairly simple device, and was in use at the time. [219] It is simply a cylindrical sheet metal shell of double construction, having a screen or filter cloth at the upper end of the innermost shell, and mounted upon an ordinary platform balance. Liquid carbon dioxide was admitted at the point clearly indicated, and entering the snow tank was partially solidified; the balance of the unsolidified

(Testimony of Charles L. Jones)

gas passing upward through the filter cloth, and outward through a carbon dioxide outlet. . The tank was suitably insulated, and provided with a necessary safety valve.

In operation the formation of solid was continued until a desired charge was accumulated, usually 400 pounds, in the larger sized tank in use, and any desired quantity, according to the size of the tank.

This was then shoveled manually out of the snow tank into a steel mold. The mold was an open mold, commonly handled on a metal surfaced wooden bench. The mold was first tamped with a tamper of conventional construction, usually of steel, but at times of wood, and after having been tamped down once, additional snow was shoveled into the mold until it was again filled to the top, and again tamped down, and in some cases a third portion of snow shoveled into the mold. A loose top plate of ordinary mold steel was laid on top of the charge, and the whole assembly, the mold with its accompanying charge of solid, was pulled into position on an open hydraulic press of conventional design, where it was pressed to form a commercial tube of approximately [220] ten inches, or 10 by 10, which is the one commercially used at the present time.

Many of these presses were single end presses; that is, the mold rested on a flat lower plate, somewhat larger than itself, so that the pressing action took place entirely from one end, that is, by pressing the top plate down onto the charge. Others, such as the one illustrated here, had a movable lower platen, together with a track on which the mold advances shown in the form of angle iron on the drawing, and in this case, in order to get satisfactory density at the lower end of the block, the block was



(Testimony of Charles L. Jones)

squeezed from both ends, instead of one end. That is, as the lower platen raises, the mold would be called floating; it would assume whatever height the function of the block carried it to.

The Court: What is the object of the filter cloth at the top of this chamber?

A. Although it was very early recognized that CO<sub>2</sub> was desirable, in order to get a high yield and good quality of solid, and that was well appreciated by my predecessors in the dry ice company, equipment for producing such refrigeration was not easily available. In short, the early industry was pinched for money a great deal of the time. As a result, in most cases, the liquid carbon dioxide in this device was fed warm, I would say 60 degrees or 75 degrees Fahrenheit, ordinary room temperature.

Under such condition, when expanded into the snow [221] tank, the snow was very finely divided, and very easily entrained under high velocity jet of gas, so if the filter cloth were omitted it would be necessary either to proceed very slowly, or you would have an excessive entrainment of solid snow particles—a snowstorm.

The Court: Did this scale automatically close off the intake to the carbon dioxide?

A. There was nothing automatic about it.

The Court: What was the scale for?

A. To close the intake in the tank.

(Testimony of Charles L. Jones)

Q. By Mr. Morris: Where on the drawing it says CO<sub>2</sub> outlet, that is what has been called in this case the blowback outlet line?

A. It is marked CO<sub>2</sub> out. The position shown on the sketch is taken from the drawing of the Martin patent, which is, I believe, in evidence, but was variously placed in any suitable position in the snow tank.

Q. Could or could not the CO<sub>2</sub> outlet be choked up by snow?

A. It could, and on many occasion was.

Mr. Foster: I object to that as calling for a conclusion.

The Court: I assume he is here as an expert, and that they are entitled to ask him that. The objection is overruled.

Q. By Mr. Morris: Do you know whether or not the [222] safety valve could or could not be clogged by snow?

A. Yes, the safety valve when first—

The Court: That gets into the gentleman's objection. We don't want his personal experience. We want his opinion on the operation of the device.

A. The answer is yes.

The Court: Very well. There is also a certain amount of outlet for the CO<sub>2</sub> through to your filter cloth, isn't there? A. Yes.

Q. So you have that outlet as well as the lower one?

A. Your Honor, let me make it clear that all of the gas produced in the solidification process went upward

(Testimony of Charles L. Jones)

through the filter cloth and down through the annular space.

Q. It went up to that storage through the outlet?

A. The purpose of the annular space at the bottom outlet was to reduce the heat leakage from the surroundings in the room. In other words, it served as an insulating barrier.

Q. Then you had the safety valve, so that in the event the pressure got too great, it would keep it from doing any harm?

A. In case the snow clogged the outlet, the safety valve would relieve the pressure.

Q. But there were no other outlets at the corners, so that it could get out? It all went down and went out [223] through the outlet at the bottom?

A. That is correct.

Q. By Mr. Morris: Dr. Jones, what do the arrows at the top, going through the filter cloth, and then going right and left, indicate?

A. As I have just described, it indicates the passage of the gas through the filter cloth and down through the annular space.

Q. Did or did not that pathway on the left, that annular space run to the bottom on the left as well as on the right of that snow tank?     A. It did.

(An adjournment was taken until Friday, May 5, 1944, at 10 o'clock a. m.) [224]

Los Angeles, California, Friday, May 5, 1944; 10:00  
a. m.

(Parties present as last noted.)

The Court: You may proceed.

Mr. Morris: Take the stand, Dr. Jones.

CHARLES L. JONES,

recalled.

Direct Examination

resumed.

Q. By Mr. Morris: In answer to our last question, you said that the unsolidified gas passed through the filter cloth and then down the annular space between the walls of the chamber and walls of the jacket and out the "CO<sub>2</sub> out", as I understood you in your last answer of yesterday.

A. That is correct.

Q. Where does it go from the "CO<sub>2</sub> out"?

A. The carbon dioxide returns to the compressor system.

Q. What is the function of the compressor system?

A. The compressor system is employed in order to return the carbon dioxide to a liquid condition.

Q. And that requires what?

A. Two things: The application of pressure and the removal of heat. Pressure is applied in a compressor and the heat is removed in a condenser.

Q. At what pressure was the liquid supplied to the snow tank?

A. At the time the snow tank was employed, it was [225] customarily the pressure and temperature resulting from cooling with water, whatever temperature that happened to be.

(Testimony of Charles L. Jones)

Q. No. My question was, Dr. Jones, what pressure was that?     A. Approximately 1200 pounds.

Q. Was that pressure reproduced in the snow tank? I think "reproduced" is not a very good word. Was the pressure at which the snow tank operated the same as the pressure under which the liquid CO<sub>2</sub> was delivered to the nozzle?

The Court: Do you mean was that same uniform pressure maintained in the tank?

Mr. Morris: Was that pressure maintained not only in the pipe leading to the tank, but was it maintained in the tank as well?

The Court: In the chamber?

Mr. Morris: In the chamber; that is right.

A. No; it was not. The purpose of the nozzle—

Q. What prevented it being so maintained, Dr. Jones?

A. The relative proportions of the nozzle and the outlet from the chamber.

Q. Very good. Was there any control of the liquid CO<sub>2</sub> from the compressor to the tank other than the nozzle and pipe?

A. Yes. There was a valve in the liquid line to shut off the snow tank.

Q. When was that valve closed and when was it opened in [226] the snow tank operation?

A. It was opened when the tank was empty and it was closed again when the platform balance showed that the desired weight of solid had accumulated.

Q. Is that valve in the inlet pipe illustrated or indicated in the drawing that you have in your hand, Plaintiffs' Exhibit 4?     A. No; it is not, it is not.



(Testimony of Charles L. Jones)

Q. What pressure was maintained in the snow tank in operation?

Mr. Miketta: If the court please, in order to keep the record straight, are we to understand that all of these matters to which the witness is testifying relate to the operation of the snow tank at the plant of the American Dry Ice Company? Otherwise, I deem this line of questioning irrelevant and immaterial, no proper foundation having been laid.

The Court: Well, I had understood that that was the case; that he was simply talking about this particular operation in which he was engaged, which was one or two plants being used at that particular time. Is that correct?

A. Yes. If the court please, this type of operation was used in altogether some eight or ten plants; and the method, the general method is the same in all cases, with only minor variations.

The Court: Then, I think the objection is sound on foundation. I think maybe you had better ask some questions, [227] Mr. Morris, to clear that up for the record.

Mr. Morris: I will, and I want to clear up the eight and ten plants of today as against the two of yesterday.

Q. The eight and ten plants were being operated and controlled by how many companies?

A. One company.

Q. And that company was?

A. The company with which I was employed at the time.

Q. Very good. You were familiar with the operation in how many of those plants? A. All of them.

(Testimony of Charles L. Jones)

Q. The only operation of which you were aware that was carried on other than in one of those eight or ten plants was carried on where?

The Witness: The question again, please. I don't understand.

The Court: Read it, please.

(Question read by the reporter.)

Mr. Morris: I think that is a little complex. May I withdraw it?

A. That is clear. The only other operation was in the plant of the General Carbonic Company in Long Island City at the time first mentioned, that is, at the time of my first contact with the industry—leave it that way.

Q. Do you know how long that continued?

A. What is that? [228]

Q. Do you know how long the operation at General Carbonic continued?

A. The operation to produce solid carbon dioxide continued to the present day.

Q. By the company of the same name?                      A. No.

The Court: Just a minute. To make this record clear—I am not sure that I asked the question; I think maybe I did: Was the operation, as depicted on this exhibit, which should be given a number; temporarily, let it be admitted in evidence for the purpose of explaining the testimony of this witness, then we will have a number.

Mr. Morris: I think it is No. 4.

The Court: I don't think it has ever been admitted.

Mr. Morris: May I offer it then?

The Court: Yes, for the purpose only of explaining the testimony of this witness.

(Testimony of Charles L. Jones)

Mr. Morris: I am told, if your Honor please, this is No. 6.

The Clerk: Exhibit No. 6.

[Note: Plaintiff's Exhibit No. 6 will be found in the Book of Exhibits at page 1330.]

Q. By The Court: Was that operation, in each of the eight plants to which you referred, substantially identical with the operation which you have indicated here?

A. It was.

Mr. Morris: One further question:

Q. And it was the operation in those plants that you [229] have been talking about, and answering, with respect to the snow tank?

A. Yes; the description was based on the operation at the Maspeth plant, of the Liquid Carbonic Company, as so stated yesterday, and an approximately similar operation was introduced in the other plants, as required, for a period of some two or three years after.

Q. What was the pressure in the snow tank?

The Court: At what time?

Mr. Morris: While it was being discharged.

A. The pressure in the snow tank was approximately atmospheric. It did, at times, rise as high as ten pounds above atmosphere, but was limited to a very low pressure in three ways: First, the light construction of the tank itself, which was customarily constructed from sheet metal of not greater than a quarter of an inch in thickness, and sometimes less; second, it was equipped with a pop safety valve normally set to relieve the pressure at 15 pounds above atmospheric; and, third, through a direct connection to the low pressure suction of the compressor

(Testimony of Charles L. Jones)

system, which was capable of keeping the apparatus pumped down to pressures between atmospheric and ten pounds.

Q. What apparatus in or near the snow tank, if any, had a tendency to keep the pressure at the pressures you suggest? A. I just answered that question.

Q. Then I withdraw it, and I will ask you whether there [230] was a valve in the CO<sub>2</sub> out pipe?

A. There was a valve in the carbon dioxide outlet, and this valve was customarily closed during the time when the solid was being removed from the tank, in order to avoid the waste of carbon dioxide through gas coming from other tanks which might be discharged at the same time.

Q. The carbon dioxide coming from other tanks, if that valve were not closed, would enter the tank in question through what pipe?

A. Through the connection marked "CO<sub>2</sub> out" on the drawing.

Q. Then it would back up? A. Correct.

The Court: Then the purpose of that valve or outlet conduit was not to have any effect upon the pressure in the tank; simply to prevent the injection into the tank backwards of extraneous gases? A. That is correct.

Q. By Mr. Morris: Did the diameter of the outlet pipe have any function or effect upon the pressure in the chamber, and if so, how and why?

The Court: Again, at what stage?

Mr. Morris: During the operation, while it was being discharged.

A. Yes, the outlet, which was customarily, I believe, two inches in diameter, and which I have already stated

(Testimony of Charles L. Jones)

was [231] connected to the low pressure compressor suction, was normally adequate in size to keep the pressure in the snow tank to the desired low pressure. However, from time to time the outlet would become plugged, or partially plugged, with solids being formed. This constriction would result with rising pressure in the snow tank, until the pop safety valve, provided for the purpose, operated, holding the pressure at 15 pounds or less, as a rule.

Q. Why do you add the limitation, Dr. Jones, the limitation,—as a rule?

A. Well, on rare occasions the safety valve itself would plug up with solid carbon dioxide. [232]

The Court: The pop valve wouldn't pop.

A. The pop valve wouldn't pop.

Q. By Mr. Morris: What was the condition of the filter at that time?

A. The filter cloths, on some occasions, burst or perforated when the tanks would overload. I would not leave the impression that that was too common a difficulty, because, crude as it may seem, this apparatus performed its definite function in the development of methods in the industry, and in spite of its defects it did operate to produce a commercial product over a period of two or three years. Those were difficulties which were occasionally experienced.

Q. Will you describe the product produced by this apparatus? A. I would commence—

The Court: May I ask a question here before you go into that: As I understand it, you had someone around watching these machines at all times? You had someone who would watch them? A. That is correct.



(Testimony of Charles L. Jones)

Q. What facility did he have to determine the pressure in the tank so as to shut off the inlet valve if something was going to pop?

A. The tanks were provided with pressure gauges.

Q. Outside? [233] A. Outside.

Q. So he had to go to sleep before he got into any great amount of trouble?

A. I want to point out here that every time we had trouble with the material, one difficulty was due to the connection freezing with the material, with the operation of the pop valve.

Mr. Morris: I will withdraw my last question, and will ask you, before we reach the quality of the product, or its density, what was the character of the solid product formed in the snow tank?

A. The solid formed in the snow tank is produced by self-evaporative cooling, which we have described before. That is to say, a portion of the liquid carbon dioxide evaporates, reducing the rest of it to solid form. In this particular case, with the liquid warm at the point of expansion, resulting in a comparatively low yield of solid, and a high velocity of gases at the nozzle, and with the snow tank pressure low, the result is a very fine powdery form of solid carbon dioxide which somewhat resembles powdered chalk, although more fluffy in its characteristics, and more difficult to handle and compress in a uniform manner. The contents of the snow tank were, as has been described, shoveled into a mold.

Q. Before we get there, Dr. Jones, I want to ask you first, has all solidified CO<sub>2</sub> resulting from the self- [234] evaporative cooling process, the same characteristics? I

(Testimony of Charles L. Jones)

don't want any explanation now; I will ask you for that later.

A. No, it has widely varied characteristics.

Q. Do those characteristics affect the character or quality or texture of the ultimate block?

A. Yes, they do. [235]

Q. Now, you spoke of the yield, Dr. Jones, of solid produced in the snow tank. Will you tell me what the yield was and what percentage and upon what figures or facts you base that percentage yield?

A. I think that term should only be used when clearly qualified as to yield per pass, or the over-all yield; that is, if we were to attach to the tank shown a cylinder of carbon dioxide and manufacture snow from the material in the cylinder, we could determine a yield by dividing the weight of solid obtained into the weight of liquid used from the cylinder. That would be the yield per pass. The yield on that basis varies from about 15 percent to somewhat over 50 percent, depending only on the temperature of the liquid used and entirely without regard to what kind of apparatus is used or its design or manipulation. In the case of the snow tank as then used, because of the warm liquid carbon dioxide employed, the yield per pass was quite low and would vary from about 15 percent to as high as 30 percent. The over-all yield, on the other hand, is the net amount of solid produced over a period of time from the total amount of carbon dioxide gas used as raw material.

Q. That is, the initial cycle and succeeding cycles of the same gas through the tank?

A. The total figure for a period of time which, in order to be significant, should be considerable, that is, daily yield is frequently without meaning because the

(Testimony of Charles L. Jones)

amount of [236] material in the system at the beginning or end of the day might cause it to vary considerably; but I should say that over a period of a month or more, dividing the weight of solid obtained into the weight or amount of gas used would give a figure for over-all yield. On that basis the snow tank method initially showed a very poor result and it was not uncommon to have an over-all yield as low as 30, 35, and 40 percent of snow from the weight of carbon dioxide used. This was later increased and the method produced yields from 80 to 85 percent of snow manufactured from the same apparatus, depending upon mechanical efficiency and tightness of the system.

The Court: I do not think you have explained clearly for the record what you mean by the ideal or 100 percent in connection with your percentages.

A. The ideal over-all yield would be a case in which the leakage becomes zero and one pound of gas would produce one pound of solid.

Q. By Mr. Morris: The solid, passing now to the solid at the end of a cycle of operation of the snow tank, with the inlet valve shut off, what did the operator find when he removed the manhole cover?

The Court: Now, by "the cycle" you mean the time from the injection through the inlet conduit to the time that they closed off the escape conduit and opened the lid; that is the cycle to which you referred? [237]

Mr. Morris: I think that is exactly it. Might it be put this way: From the time of the opening of the inlet valve to the closing of the outlet valve?

The Court: Without relation to the lifting of the lid, because that is not taken out?

(Testimony of Charles L. Jones)

Mr. Morris: That is all. And I just wanted us to see what the operator saw when he removes the manhole cover.

A. He would be looking at a box packed with snow.

Q. With what physical characteristics?

A. Repeat the description just given; it would be light, powdery and chalky in consistency; and while possible to pack, it would not pack in the sense in which ordinary wet snow packs to form a snowball.

Q. How solid was it in the mass?

A. When properly filled, it could be easily shoveled without the use of other tools or other means to break up the mass; in other words, it was easily penetrated by the edge of a shovel.

Q. Did it come out in granulated form, like granulated sugar, or did it come out sometimes like blocks or lumps, or both?

A. Never like granulated sugar; always of very much finer particle size, more like, perhaps, slightly damp flour; and it came out in chunks.

Q. Then into what was it shoveled?

A. It was shoveled into a mold, and as described [238] yesterday, was tamped in this mold—

Q. Just, if you will pardon me, Dr. Jones. The mold into which it was shoveled is indicated on plaintiffs' drawing Exhibit 6?

A. Yes; it is.

Q. What was the purpose of tamping?

A. The purpose of tamping is twofold: First, and the common conception of the principal reason, is to expel the gases and air entrapped in the spaces between irregular chunks of material put in the mold. This is important, but even more important, it is necessary to distribute the

(Testimony of Charles L. Jones)

material in the mold so as to have a uniform packing at the start of the pressing process and to distribute the impurities more evenly, more particularly the water snow always associated with the product.

Q. Was the tamping a non-standard or standard practice?

A. Tamping was at that time a universal practice. Although individual blocks had been made experimentally without the method, the snow tank procedure commercially and over a period of time was always employed with the tamping process, because only in that way was it possible to supply the trade with a reasonably uniform and sufficiently dense product to meet their needs.

Q. Before we get to the character and quality of the final block, will you tell me whether there were any losses in the solid product from the time the manhole cover was [239] taken off until the ultimate block was produced?

A. There were. There was a loss of from—I would say, from 7 to 15 percent, and averaging about 10 percent of the material, lost in handling through shoveling in the open room and in tamping and in subsequently pressing in the open. I think it should be stated here also that all the figures obtained at the time are to some extent deceiving in that this process exposing the solid to the air varied considerably from day to day according to the relative humidity of the weather. On a very damp day a much larger amount of water snow would be condensed in the pores of the material during handling, and this had some desirable and some undesirable characteristics, but in all cases produced a false result as to the final product, that is, we were to some extent giving the customer a certain amount of water snow in place of the solid carbon dioxide which he thought he was getting.



(Testimony of Charles L. Jones)

Q. By The Court: Does this material have any particular affinity to moisture?

A. Yes; very definitely. Low temperature alone is sufficient to dry air considerably below the point where it could ordinarily be dried by calcium chloride, for example.

Q. By Mr. Morris: Are there any advantages or disadvantages in the snow tank operation at atmospheric pressures?

A. Yes. The first advantage was low cost of construction, and one of the main advantages of this method in the [240] early days of the industry was its low cost obtainable only in a low-pressure apparatus. That, however, is decidedly secondary to the character of the snow when it had to be handled or shoveled, because only with the low-pressure operation could a loose, fluffy material be produced which lent itself to manual handling.

Q. You did give me a moment ago, I believe, Dr. Jones, the percentage of average percentage of loss.

A. 10 percent.

Q. Will you define "subliming" or "to sublime"? What does it mean in this art?

A. The word, I think, in this or any art simply means the passage of a solid material directly to a gas without passing through a liquid phase.

Q. While I think of it, Dr. Jones, will you inspect the block of snow ice which was put into the courtroom just before the beginning of the session on day before yesterday and tell me its present status? Could I bring it around?

A. I am afraid I can't do that. It was not snow ice.

Q. I stand corrected. What was it, Dr. Jones?

A. This was the present commercial product. Had it been snow ice it would have disappeared long since.

(Testimony of Charles L. Jones)

Q. You find how much of the block left, expressed in pounds, approximately?

A. Oh, that is pretty difficult to guess that. I should say that there is possibly 5 pounds out of an original 50. [241]

Q. Very good. I see that the space around that is dry, notwithstanding the remainder of the block which weighed approximately how much when it was brought in?

A. 50 pounds.

Q. So we will say 45 pounds of it have disappeared and with no wet spot there; how do you account for that?

A. I would not account for it, because I believe there is a wet spot there. The tendency of the material to condense moisture from the atmosphere has had its effect here, and because of the air conditioning in the court, the moisture content here is not high enough to produce very much, but there would be some frost, enough to moisten it.

Q. You mean that as a cold water drinking receptacle sweats on the outside in a warm day?

A. Precisely. The moisture, in other words, was not in the product.

Q. Now, Dr. Jones, will you tell me why there is not a puddle of water there and what event has happened to keep that from being quite wet there?

A. Well, the principal change is the introduction of the Cole and McLaren press in the industry.

Q. No; I don't want to come to that yet. Can you give me an answer using the word "sublime" in any way? Has it melted, has it sublimed, has it vanished?

A. The carbon dioxide has sublimed, but the carbon dioxide, in any event, even though it melted, would not leave [242] a spot of water on the floor since obviously it is not water.

(Testimony of Charles L. Jones)

Q. Then the solid has sublimed into what, if not a liquid CO<sub>2</sub>, into what?

A. Into carbon dioxide gas.

Q. Very good. Now, will you be good enough to describe the character, quality, texture, density, of the snow tank ultimate product, the block?

A. The final product in the snow tank varied in its height from time to time, according to the human element involved in the operator's tamping and filling of molds, from about 9 to 10- $\frac{1}{2}$  inches in height. The weights of the blocks varied from about 36 to about 45 pounds. However, on the basis of a 10-inch cube, which is a customary size, as stated to the trade, the product averaged 40 pounds per block, 10-inch cube. This corresponds to a specific gravity or density of about 1.2; that is, the block was about 20 percent heavier per unit of volume than the corresponding volume of water.

Q. By the Court: That is, using the maximum density of water as the standard? A. Yes.

Q. Of 1.2? A. Yes.

Q. By Mr. Morris: Were such blocks available for use or shipment to distant markets?

A. No; only within narrow limits. They did at that time [243] undertake to ship as great distances as from New York City to Philadelphia, by truck, and for a shipment of that kind where a time period of only perhaps eight or ten hours was involved between the shipment and the delivery, the product was, although not good, good enough to get by under the conditions then obtaining. However, it was not suitable for shipment by refrigerated freight car over larger distances, nor for holding a long time; and the customery practice in the industry was to

(Testimony of Charles L. Jones)

spare no effort to sell it as rapidly as possible after it had been manufactured.

Q. Is there anything else that you can tell me with respect to the texture of such blocks in so far as its texture or quality affected its commercial value?

A. Yes. It did vary from time to time according to the moisture content which varied with the weather, according to the perfection obtained in tamping, which varied with the particular man who happened to have tamped the mold, and with the condition of the mold itself, which would produce one result when used warm at the beginning of a day's run and a quite different result after it had stood in a moist atmosphere until it was thoroughly coated with water ice, resulting in a much greater friction along the walls of the mold during the pressing operation, the net result being that the density was not constant; that there was a variable amount of water snow included which was not always evenly distributed, and this, when the product was cut into [244] small pieces by band-sawing resulted in a variation in the rate of evaporation of these pieces, and also in the varying in the sawing loss, which caused rather frequent complaints from customers. [245]

The Court: Wasn't there another element of variation in the handling from the snow tank to the mold—the facility with which that was done?

A. Yes, some operators are much more skillful than others, and get a different result.

Q. By Mr. Morris: You spoke about density a while ago. I think you did not tell me whether the 1.2 was the general average density of a number of blocks, or whether the density of the block throughout one block was affected by that approximate density. Will you do so now?

(Testimony of Charles L. Jones)

A. I gave the figure as a commercial average over a considerable period of time. It would not indicate the variations in individual blocks. However, until late 1927 the double-ended feature of squeezing the blocks from below as well as from above, was not in the picture at all. For blocks pressed from one end there was naturally some variation in density, due to the mold wall friction, so that the end of the block nearest the moving platen, which in this case was the loose plate, was approximately 10 per cent higher in density than the material in the same block at what we call the dead end of the block.

Q. Was that density of a single block affected by the perfection, or lack of it, in making equal distribution of the snow in the mold before it was pressed?

A. Yes; although the effect of poor tamping is more apparent when the moisture content is high than when the [246] moisture content is low.

Q. That is a noticeable difference, a commercial difference, or a practical difference? What would you say as to that, Doctor?

A. I would say when an effort is made to improve the product by increasing the density, that is, by pressing harder, these differences in the moisture content and in the tamping become increasingly apparent, so a poorly tamped block, when pressed to maximum density, results in a broken block in many cases, sometimes an exploded block, and faults, fissures, and uneven water in the distribution gets an increasing chance to show up when the block is pressed to the maximum. We avoided this commercially by simply abandoning the effort to get a high density, and compromised on a density of approximately 1.2, and at that density the block was well enough con-



(Testimony of Charles L. Jones)

solidated to look well, but not sufficiently pressed to reveal to the customer the flaws which were actually present, nevertheless.

The Court: What was, approximately, the density of that block?      A. 1.5.

Q. By Mr. Morris: And, theoretically, the density of CO<sub>2</sub> solid is what?      A. 1.56.

Q. What can you tell us about the cost of the manual labor from the time of beginning to remove the man-hole [247] cover on the snow tank to the completion of the block of snow tank snow?

A. The labor cost by this process was very high. I want to specially avoid leaving any impression with the court that this process was without merit. On the contrary, it was very helpful to the industry in getting started, and, obviously, when the market was so small that it was not even possible to sell at all times as much material as one man would be able to shovel out and tamp in this mold, the inefficiency of the process was of no consequence whatever. It would take at least one man to make the product by any process.

Q. Will you tell me what the cost of the manual labor was?

A. However, to make a fair comparison, it would perhaps be better to take a plant making a considerable amount of product, and for that purpose I want to take the Elizabeth plant, of the Dry Ice Corporation, which was the first operation of any size to make use of the process, and at that plant the snow room labor cost, which includes only the operation of emptying tanks, tamping, the price varied between about \$6 and about \$9 per ton of dry ice produced, averaging about \$7. With larger

(Testimony of Charles L. Jones)

production, no doubt these figures could have been reduced somewhat.

The Court: What percentage would that be of the manufacturer's selling price? [248]

A. As of that time?

The Court: Yes.

A. That would be about 10 per cent, I think.

Q. By Mr. Morris: That is, the sales price as of those dates was about \$70 a ton?

A. That depends upon just what year you are talking about. The sales price initially was higher than that, and was steadily reduced to the trade as fast as the advance in the industry permitted, and so I would say it would be less than 10 per cent perhaps in 1927, and possibly more than 10 per cent when the price situation became different.

Mr. Miketta: May I ask, your Honor, that the witness identify when the Elizabeth plant was actually in operation, because we haven't heard about that plant before?

The Court: Yes.

A. The Elizabeth plant was completed and placed in operation in 1928, and was operated for a period of only four years before it was considered to be obsolete, and was replaced with other facilities.

The Court: How many separate snow tanks did they have at that plant?

A. They had three benches of four tanks each; that is, 12 snow tanks.

Q. You would operate four tanks on one press?

A. That is correct. Actually, during most of the period that plant was operated, there was one extra tank on [249] each bench, and three of them were actually used, and the fourth was in stand-by condition so in case of any repair it could be taken care of.

(Testimony of Charles L. Jones)

Q. By Mr. Morris: Will you give us in dollars the approximate amount of loss resulting from the open-air operation of shoveling snow out from the snow tank into the open mold and placing the open mold into the press?

The Court: Will you read the question?

(Question read by the reporter.)

The Court: You will have to change the form of your question. You haven't any relationship of dollars to the product.

Mr. Morris: I think he said it was about 10 per cent. I think he testified it averaged about 10 per cent loss of the solid.

The Court: He did not say loss; he said cost; that the labor, the cost of that operation, was about 10 per cent of the wholesale or manufacturer's sales price.

Q. By Mr. Morris: Dr. Jones, have you testified as to the percentage of loss of solid due to the handling of the product from the snow tank to the ultimate block?

A. There was an earlier question to that effect.

Q. Your answer was what?

A. I said that it varied from about 7 to about 15 per cent, an average of approximately 10 per cent loss from the snow weight on the scale in the tank to the finished [250] product weight on the shipping platform.

The Court: The answer is more clear now as to the cycle he was describing.

Mr. Morris: I was going to ask him that. Has your Honor the question now in mind?

The Court: The only thing I objected to was the form of that question. I don't think it would mean anything to me. Now, I understand.

(Testimony of Charles L. Jones)

Q. By Mr. Morris: I think probably the record shows enough. I will ask this one question: Can you translate that into dollar losses, Dr. Jones?

Mr. Miketta: No foundation has been laid to indicate that this witness knew the cost at the Elizabeth plant.

The Court: I don't think we have the standard. If it is purely a question of what the loss was per ton at \$70.00, it simply means a computation, which any of us can do, but if it is anything else, no proper foundation has been laid.

Mr. Morris: I will withdraw the question.

The Court: Mr. Morris, I know it is hard to ask questions; you get tired; and whenever you want to take a recess just say so. I usually run along until 15 minutes after 11. But it makes no difference to me.

Mr. Morris: That is very kind. I think perhaps if I can ask one or two more questions I am through with the snow tank and the snow tank operation, before we go into [251] the Cole and McLaren, and there might be a good time to stop.

Q. Dr. Jones, do you know of any snow tanks in operation in the industry anywhere in the United States today? A. No, I do not.

Q. What was the last one in operation that you had any knowledge of?

The Court: You are speaking now commercially?

Mr. Morris: Yes, your Honor.

A. So far as I know, the last snow tank passed out of use in 1934.

Q. What apparatus supplanted it?

A. The vertical press, known as the Cole and McLaren press.

(Testimony of Charles L. Jones)

Q. How close was it in structure and function to Figure 5 of the Cole and McLaren patent here in issue?

A. Except for details of hydraulic operating valves and hydraulic connections, I should say it was practically identical.

Mr. Morris: Now I am going into Cole and McLaren. I can do that either now or after the recess.

The Court: Suit yourself.

Mr. Morris: Very good. Then I will ask one more question:

Q. Dr. Jones, you spoke of self-evaporating cooling, in which the solidification of a portion of the carbon [252] dioxide was effected by the evaporation of the remainder. How many operations or methods of such self-evaporating cooling are there?

A. There are at least six, possibly more, different ways in which solid carbon dioxide can be made from liquid, each one producing a different product of characteristics as different, let us say, as crushed rock for road use is from fine sand or clay used in the ceramic industry.

Q. As a practical proposition, how many of these self-evaporating cooling methods can be carried out in the snow tank, which we have been discussing?

A. I think that might be clear by stating what would happen in a snow tank specially constructed, made sufficiently strong, if the conditions were somewhat changed. That is, let us suppose we have such a strong snow tank, and steadily increased the pressure during the snow forming operation. As this pressure is increased the temperature at which the solid is formed is also increased. At the same time the velocity of the unsolidified gases is steadily



(Testimony of Charles L. Jones)

reduced, because the same amount of gas can be taken away and compressed into a somewhat smaller volume.

At the same time the crystal size of the snow is steadily increased, because with the lowered velocities and high yield, the individual droplets of the liquid entering the tank are somewhat larger, and have sufficient time to form larger aggregates. [253]

This can be demonstrated in many ways, and gives a steady progressive change in the character of the snow which is formed, until, as the pressure rises we reach the melting point or triple point of the carbon dioxide, which is formed at approximately minus 70 degrees Fahrenheit, or approximately 40 degrees above the freezing point at atmospheric pressure, and under a pressure of approximately 60 pounds above atmospheric. That is, when a pressure of 60 pounds is reached, for the first time we will have no longer dry snow, but we will have damp and moist snow. We can then, at the same pressure, of 60 pounds, by merely varying the rate at which the gas is taken away, produce a whole series of products ranging from damp snow, such as in the case of water snow, which would make a fair snowball, or from wetter to wetter snow, slush, and eventually, still at the same pressure, products which would deposit in the tank a bath of liquid carbon dioxide, carrying in suspension only a few crystals of solid, corresponding, let us say, to a pond or puddle into which a little bit of snow has fallen at the freezing point of water.

If we continue to raise the pressure, at every pressure above the triple point the tank will be filled with a bath of clear liquid carbon dioxide, containing no solid whatsoever. Observe, however, that not only the carbon dioxide, but

(Testimony of Charles L. Jones)

also all of the solid impurities, that is, water, oil, or any other materials that may be present in [254] the form of impurities, are also varying their characteristics at the same time that the solid varies. That is, a condition which produces very fine snow also produces very fine subdivision of any frozen water or oil, and a condition which produces very coarse snow would produce coarser water or oil. When we pass the triple point, and commence to fill the chamber with liquid, we are still freezing the higher impurities, so the oil and water are solidified, and the carbon dioxide may be a clear liquid. All of those factors have a definite influence on the product manufactured.

In order to make solid in this fashion from a bath of liquid it is then necessary to close the liquid carbon dioxide inlet and reduce the pressure, boiling off the bath of liquid, and leaving a solidified portion in the tank. However, if these operations were to be performed in a snow tank specially constructed to withstand pressures, we would then have the problem of getting the material out of the snow tank, and we would find that in our series of products, made at increasing pressure in the snow range, we could shovel them out satisfactorily and use them. The slush range products, however, which were made with wet snow, would be cemented together by the formation of crystals in the liquid bath so as to be considerably more coherent, and the liquid products made above the triple point would also cohere into a mass so that it would be necessary to use [255] perhaps a crow-bar, perhaps some mechanical handling equipment; certainly it would be necessary to use some special scheme for getting that material out of the snow tank, and we would probably be somewhat limited in the range of boiling rates

(Testimony of Charles L. Jones)

which we could employ to make products which might be handled at all. Is that clear?

The Court: I think so; I am not sure, so I will ask the reporter to read that back. Of course, I suppose, as a practical matter, in answer to that question, you could say, could you not, that the product to be produced in the snow tank could be varied, depending upon the change in velocity of the carbon dioxide at the inlet, the variation in pressure and the change in the size of the aperture at the valve outlet? A. Correct.

The Court: When you have said that you have said about everything, haven't you—temperature, to some extent?

A. Yes, you have, only there are several products of primary industrial importance that could not be made in the snow tank at normal variation in the snow tank.

The Court: I am only attempting to say, by those changes you are bound to change the product that is made in the snow tank, isn't that correct?

A. That is correct, but it is not fully understood until at the same time you recognize three classes of such snow products, [256] the moist and slush products, and the so-called triple point product made by boiling off a bath of liquid.

The Court: As a preliminary explanation, those are the facts, are they not? A. Yes.

The Court: With that understanding, let us have the question read and the answer, and we will see if we understand it.

(Question and answer read by the reporter.)

Q. By The Court: When you talk about the triple point you mean the melting point of the carbon dioxide at

(Testimony of Charles L. Jones)

approximately 70 degrees Fahrenheit?

A. Yes, sir.

[257]

Q. By The Court: Now, then, without going into details, and taking into consideration the variations which we were talking about before, what you say is practically this: That if you increase the weight and strength of the shell so as to withstand higher pressure inside the tank, that as a laboratory experiment you could make quite a wide range of products?

A. That is right.

Q. As a practical matter, the snow tank was only designed for the purpose for which it was really used?

A. Correct; that is correct.

The Court: We will take our recess.

(Short recess.)

Q. By Mr. Morris: Then, the number of self-evaporating cooling methods for which the snow tank was practically applicable and adapted was what?

A. Only one.

Q. Only one; and that one was what?

A. That one was the customary method, low-pressure formation of dry, powdery snow below the triple point.

The Court: May I ask one question to be sure that is clear before we leave that?

Q. As a practical matter, this snow tank was designed to have the carbon dioxide injected at high pressure and diffused to atmospheric pressure, to operate more quickly, more efficiently, to accelerate the operation, and produce [258] the product that you wanted?

A. No; I would not say that it was constructed that way in order to produce it more quickly and more efficiently. I would say that—

(Testimony of Charles L. Jones)

Q. Leave the "more efficiently" out entirely, then.

A. Well, I would not even say that it was constructed that way in order to make it more quickly, because it does not make it any more quickly than the other processes; in fact, it is rather slower. However, I would say that in the early days in the industry, I think anyone who had connection with it would be quite willing to admit that we did not always know what we were doing, and in the case of the snow tank it was a scheme which, at the time and for the market that we had, it worked; it was not too expensive to manufacture; it was constructed of light metal parts; and it could be put together rather quickly and obtained almost anywhere, and its apparent inefficiency is, to some extent, offset by the fact that it was easy to construct and almost anyone could be taught to operate it. It did not seem to be highly dangerous; it did not seem to involve very many chances. In other words, it is the first affirmative step, if you wish, in the industry, and was particularly useful in opening up a market where you might have only a demand for a small quantity of material and you might not want to get into anything more expensive than that.

The Court: Thank you. [259]

\* \* \* \* \*

Mr. Morris: Very good. Strike out the previous partial answer.

Q. Dr. Jones, you have read and are familiar with the patent in suit? A. I am.

Q. Have you Fig. 5 thereof before you? If not, I will get it for you. You have told us approximately when that apparatus went into operation?

A. In the fall of 1928.



(Testimony of Charles L. Jones)

Q. And you have told us that it had supplanted the snow tank apparatus—to what extent and when?

A. Perhaps it would be clearer by taking it by seasons. It is customary always to plan the producing apparatus during the winter season to supply the trade for the big season in the summer.

Q. If you can tell me in years without regard to seasons, Dr. Jones, I would be obliged to you.

A. All right. Then, by years, commencing immediately with the '28-'29 season, all production facilities which went into points requiring carload shipment to remote markets used this type of apparatus in 100 percent of cases, since only in this apparatus could we make a product suitable for such shipment—

Q. To what extent— [261]

A. In other plants, the introduction was somewhat slower, and there were even some additional snow tanks put into service in 1929 and 1930. However, by about 1933 about 90 percent of the industry was using the vertical closed press and not more than 10 percent of the product sold was made in other forms of apparatus.

Mr. Miketta: I beg your pardon, Mr. Morris. I move to strike the answer, your Honor, unless the witness positively identifies what apparatus he is referring to, because he has simply referred to a "type of apparatus."

The Court: You may examine him on voir dire, if you wish.

Mr. Miketta: May I do that at this time?

Mr. Morris: No.

Q. You have heard the statement of learned counsel for the defendants. Will you explain what you meant by "type of apparatus"?

(Testimony of Charles L. Jones)

A. Well, I was compelled to refresh my memory this morning by referring to a survey which I made in December, 1933, and at that time reviewed the plants then in operation and operated, I believe, by four or five different manufacturers, as to the particular manufacture of the presses employed by them. They were all vertical closed-chamber presses of the general type shown in Fig. 5. They were not all identical with it.

Q. Wherein did the apparatus to which you refer differ in element or function from the apparatus illustrated in [262] Fig. 5 of the patent in suit?

A. Referring back to the survey which, as I said, I made in '33, at that time I was able to count 55 presses or apparatuses then in use, of which I think I had personal knowledge or had seen about 45 of them, or the greater part, but not all, we will say. Of those presses 50 were the vertical closed type and, I believe, 12 of the 50 were manufactured by the Frick Company and were the inverted form of press which is indicated schematically, if that is the word, by the diagram marked B on the blackboard.

Q. Plaintiffs' Exhibit No. 3; is that what you mean?

A. Yes.

Mr. L. S. Lyon: No; that diagram on the blackboard.

Mr. Morris: Oh, very well. Proceed.

Mr. Miketta: May the court please, I have had a draftsman try to reproduce the sketches A, B, C on a placard, and I notice that he has filled in the little squares which we have indicated as representing the means for operating—

The Court: The hydraulic equipment.

Mr. Miketta: Yes. But I believe those follow A, B, and C as we have sketched them, except that C has been

(Testimony of Charles L. Jones)

completed on both sides. So that if the witness cares to refer to this, he may.

The Court: Yes. Let them be marked for identification as the defendants' next exhibit in order.

The Clerk: A. [263]

[Note: Defendants' Exhibit A will be found in the Book of Exhibits at page 1357.]

Q. By Mr. Morris: Will you complete your answer, Dr. Jones? That is, you spoke about 10, I think.

A. My answer, then, was—it can be read back. It is complete.

Q. I beg your pardon?                    A. I completed it.

Q. The remainder of the number were of what type?

A. There were 5. One was a European apparatus known as the Carba process; two were snow tanks; and I would have to refer to my original letter to know just what the other two were.

Q. Yes. Dr. Jones, I had in mind the remainder that you speak of as being of the type of Fig. 5.                    A. Oh.

Q. And not the make of the other types.

A. Well, I would say that as to all important features they were the press of Fig. 5.

Q. All right; very good. How many of the self-evaporative cooling methods can be carried out in the apparatus of Fig. 5?                    A. All of them.

Q. And the number you give us is what?

A. May I have that book? I believe there are eight listed there. The subdivision is more or less arbitrary.

(Testimony of Charles L. Jones).

Mr. Miketta: May I inquire as to what the witness is referring to? [264]

A. Nine. There are nine different methods or schemes of depositing a solid of different crystal structure and different form, with various pressure cycles; and the answer is that all of them can be practiced in the vertical press of Fig. 5.

The Court: The question is: What is this that you are referring to?

The Witness: Oh.

Q. By Mr. Morris: The book to which you refer is what?

A. The book to which I refer is Quinn-Jones.

Q. Published when?

A. In 1936, by Reinhold Publishing Corporation.

Q. Who is the Jones that you refer to when you say it is Quinn-Jones book? A. Myself.

Q. The title of the book is what?

A. Carbon Dioxide.

Q. You referred to pages 206 and 207?

A. I do.

Q. Do you recall when you first saw this apparatus?

A. Yes. I saw the apparatus in the Long Island City plant of the General Carbonic Company, either late in November or early in December of 1928. [265]

\* \* \* \* \*

Mr. Morris: He has told us partly in the answer already given; that is, they were unsatisfied with the blocks that could be produced in the snow tanks, that were not available or adaptable for shipment to the more distant markets, as the witness has told you. Dr. Jones himself

(Testimony of Charles L. Jones)

was engaged in trying to find how to make a better product. Dr. Jones himself had, in his own laboratory or cellar, made what is referred to as triple point ice in a pipe. Dr. Jones was seeking to find some practical apparatus, thinking of how some practical apparatus could be made, that would make triple point ice practically and commercially. He did not know of any apparatus that could do it. I am telling you what he has told me. [267]

\* \* \* \* \*

Q. Dr. Jones, had you before you saw the vertical apparatus of Fig. 5 of the Cole and McLaren patent endeavored to make triple point ice experimentally?

A. Yes.

Q. Triple point CO<sub>2</sub> ice?

A. Yes; and I had made such products.

Q. In what?

A. By filling a piece of pipe with liquefied carbon dioxide and boiling it off, removing the triple point crystals so formed and placing them in the mold of the snow tank apparatus, and finding, somewhat to my surprise, that it was not necessary to tamp crystals of that character because they would slide more readily over one another, did not tend to pack in quite the same way, and it was possible [268] to simply throw crystals of that kind into the mold, bring pressure to bear on them, and get the required density, without the defects in the block showing up.

Q. In making triple point ice is the pressure held constant or not; in making triple point CO<sub>2</sub> solid is the pressure held constant or not?

A. I should say that it may or may not be during the filling operation, but during boiling down it is automatically held absolutely constant at the boiling point, or at the melting point, rather, of the carbon dioxide.



(Testimony of Charles L. Jones)

Q. What kind of pressure do you call that?

A. That is triple profit pressure.

Q. In the operations that you described earlier this morning is or is not the pressure held constant, or approximately so, in the snow operation?

A. Yes; it is held constant.

Q. Do you use any other term for that?

A. Other than "constant"?

Q. Yes. A. Do you mean just another word?

Q. Yes. A. To express the same idea?

Mr. Foster: Objected to as immaterial.

The Court: Well, I can't tell. He may answer, if he can.

A. Definite, exact, approximately uniform, steady.

Q. By Mr. Morris: Had you been able to find, Dr. Jones, [269] any apparatus in which the triple point carbon dioxide solid could be made before you saw the Cole and McLaren press?

A. We knew of no such equipment commercially available to us. We naturally started at once to study, speculate as to what kind of equipment we might get for that purpose, and we had done a good deal of thinking about it but we did not actually have any equipment available for that purpose until the Cole and McLaren machine came out.

Q. What was your remark when you saw the Cole and McLaren press, vertical press?

Mr. Miketta: That is objected to, your Honor, as being immaterial.

The Court: Objection sustained. The objection was sustained.

(Testimony of Charles L. Jones)

Q. By Mr. Morris: Where was this Cole and McLaren press which you saw?

A. That is already in. The General Carbonic Company's Long Island City plant.

Q. What were the circumstances under which you went over to see it?

Mr. Foster: Objected to as immaterial.

The Court: Objection sustained.

Q. By Mr. Morris: Did you examine the apparatus when you saw it?            A. I did.

Mr. Morris: In order that we may refer to them as an [270] exhibit, may I have them marked as plaintiffs' exhibit No.—

The Clerk: 7.

Mr. Morris: 7.

The Court: 7, collectively.

[Note: Plaintiff's Exhibit No. 7 will be found in the Book of Exhibits at page 1331.]

Mr. Morris: Collectively, there being 9 sheets. I don't know whether your Honor wants to go into this fully, or will you break in?

The Court: No. I think we had better take care of the noonday recess now. These can be marked collectively as one exhibit, because they have the headings "I, II, III, IV" etc., already down to "IX".

At this time we will adjourn until 2:00 o'clock.

(Whereupon a recess was taken until 2:00 o'clock p. m. of the same day.) [271]

Afternoon Session.

2:00 O'Clock.

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The Court: You may proceed.

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CHARLES L. JONES,

recalled

Direct Examination

resumed.

Q. By Mr. Morris: Dr. Jones, I ask you to refer to chart I of Plaintiffs' Exhibit 7 and explain what that is.

Does your Honor care to work with this or with that (different sized diagrams)?

The Court: No; this is all right.

A. Chart I of Exhibit 7 is a schematic drawing of the chamber of the Cole and McLaren press, with its immediately associated parts, showing the positions of the parts of the structure at the end of the cycle. In this drawing the upper plunger is shown as in its lowermost position—

Mr. Foster: Pardon me, your Honor. I have an objection I want to interpose. Unless the witness is referring to the Cole and McLaren device as being the device described and illustrated in the patent in suit, objection is made and motion to strike his answer is made on the ground it is immaterial.

The Court: Yes. I think the question should be made more specific.

Q. By Mr. Morris: Considered as a whole, what do the nine— [272] question is withdrawn and I will put it in leading form. Are these nine drawings of plaintiffs'

(Testimony of Charles L. Jones)

Exhibit No. 7 drawings to illustrate the vertical structure of the Cole and McLaren patent in suit, indicated and illustrated by Fig. 5 of that patent?     A. They are.

Q. You may continue your answer, if you had not finished.

The Court: Just a moment.

Mr. Foster: If the court please, I object to the continuation of his answer on the ground that the charts are not yet identified as illustrative, as being exactly of the device illustrated and described in the patent in suit, and therefore immaterial.

Q. By Mr. Morris: Wherein, if at all, does chart No. I of Plaintiffs' Exhibit No. 7 differ or depart in any way from the apparatus of the patent in suit?

A. Comparing Fig. 1 of Exhibit 7 with Fig. 5 of the patent in suit, the upper and lower hydraulic cylinders are omitted, no tie rods are shown, the dividing member 110 of the patent is omitted—

The Court: Well, I don't believe that it is necessary for us to tear it down. As I understand it, these are in effect, by drawings, by schematic drawings, analyses of the various elements of Fig. 5 of the patent in suit; is that correct?     A. That is correct. [273]

The Court: All right; then go ahead with your answer from there.

Q. By Mr. Morris: In different stages of the cycle of events in the operation of the plant?

A. Yes; that is correct.

Q. All right. Then, will you continue your answer to Fig. 1?

Will you pardon me just a moment?

(Testimony of Charles L. Jones)

What do the positions of the various parts of the apparatus in drawing No. I of Plaintiffs' Exhibit 7 indicate?

A. They indicate a block of solid carbon dioxide has just been removed from a press having its parts in the positions shown.

Q. What is the valve position in the CO<sub>2</sub> inlet?

A. The CO<sub>2</sub> inlet is closed.

Q. The valve position in the high-pressure and low-pressure channels?

A. In this drawing both high and low-pressure are shown as closed. Low pressure, however, might optionally be opened or closed at that point.

Q. Speaking as a whole, these charts are intended to indicate the different stages of operation, are they, or are they not, during the cycle of events of making a single block of ice?

The Court: Read that question, please.

(Question read by the reporter.) [274]

Mr. Morris: Question is withdrawn.

And I will ask whether this indicates the cycle of events as illustrating the actual use of the apparatus of plaintiffs?

Mr. Foster: That is objected to as immaterial, unless the question is confined to the operation as described in the patent.

The Court: Objection is sustained. Now, let us just take one drawing at a time. This drawing I of Exhibit 7 shows the plunger at the end of one cycle of operation, does it not? A. That is correct.

The Court: All right; now let us go on with the next one.

Mr. L. S. Lyon: If I may add this: We would like to have it appear from the witness' testimony that these dia-



(Testimony of Charles L. Jones)

grams are showing and illustrating how the press is actually employed in commercial operations in the plants with which the witness is familiar. These are to show just how the press is operated in making ice when the press is actually commercially used. It does not make any difference whether there is any such description in the patent. This is not in variance with the patent in any way, but we have a patent here on a device. Now, we are entitled to show to the court and for the record how that device is actually operated in commercial use. I think the witness has not been given an opportunity to testify for the record that [275] these drawings are to explain to the court just how this apparatus is used commercially.

The Court: My objection was to the order of proof. It seemed to me that in order for me to rule intelligently on it he has to go through these various articles.

Mr. L. S. Lyon: That is right.

The Court: And show what they are, and then ask him the generic question.

Mr. Morris: Very well.

The Court: Otherwise I think the objection is sound.

Mr. Miketta: If the court please, I would like to object to the use of Exhibit 7, moreover, on the ground that it has not been stated that this is a true or correct representation of what is shown in the patent. No foundation has been laid for this Exhibit 7 so far, and it is irrelevant and immaterial, because the suit is brought on a patent and not on a machine which is being used in some unknown plant and constructed by some unknown persons, and which is not before your Honor.

The Court: That was the basis of my hesitation at the question at that stage of the game. So far, here is what

(Testimony of Charles L. Jones)

the record shows: The record shows the patent in suit; as a part of the patent in suit we have Fig. 5. The Fig. 5 has been magnified in size and is before me here. The witness has now testified that Exhibit 7 is a schematic drawing indicating Fig. 5 in its position at the close of the [276] cycle of manufacture in making a block of carbon dioxide, solidified.

Q. Is that not true?

A. That is correct. That is as far as I have answered.

The Court: So far, it seems to me that is material. In other words, this witness has a right to give, by his testimony, his analysis of the various elements that go to make up Fig. 5, but it does not make any difference whether it by a schematic drawing, or what he does it by; it only illustrates his testimony, and it is admissible only for the purpose of illustrating his testimony. They have not yet been offered in evidence, and I shall limit them to that when the time comes, of course. They are not supposed to be exact drawings, or take the place of the patent drawings. I will have to determine that—whether they really represent the operation of this machinery. Here we have an expert explaining this machine. Part of his explanation is this series of schematic drawings.

Q. By Mr. Morris: Will you explain chart II then, and compare it with Fig. 5?

A. Chart II shows the next step in which the closing head has been raised into chamber sealing position. The carbon dioxide inlet remains closed; the lower pressure outlet remains closed, and the high pressure outlet, for unsolidified gas, has been opened.

The Court: You are just getting ready to start the next [277] cycle, aren't you?

A. Yes.

(Testimony of Charles L. Jones)

Q. By Mr. Morris: What is the legend on that? Is that a correct legend?

A. "Start of cycle, closing head in closed position." That is correct.

Q. Will you turn to chart III, Plaintiffs' Exhibit 9, and explain that?

A. Chart III is headed "Position for charging CO<sub>2</sub> into chamber." The valves remain in the same position as just described, the upper, or pressing plunger, however, has been raised to its uppermost position, and an arrow has been inserted along the conduit marked "Outlet for unsolidified gas" to indicate that this is now connected with the compression system, and the chamber will be filled by a back flow from that system with carbon dioxide, under whatever pressure exists in a particular compression system at that point. In ordinary practice that might be 40 to 60 pounds per square inch.

Q. What would be the direction of flow in the high-pressure outlet, on that chart III?

A. As indicated it is back flow from the pressure system into the press.

Q. What would be the back flow of gas, of unsolidified gas, after the valve in the CO<sub>2</sub> inlet has been opened?

A. It would be outward from the press; reversed [278]

Q. In a reverse direction from the arrow?

A. Yes.

Q. Will you turn to No. IV?

A. No. IV is headed "CO<sub>2</sub> being charged into constant volume chamber."

(Testimony of Charles L. Jones).

Q. What is indicated by the arrow at the CO<sub>2</sub> inlet pipe?

A. The carbon dioxide inlet has been opened and liquid carbon dioxide admitted thereby into the chamber. This, again, might be at any convenient pressure and temperature, according to the equipment that you have been using at the particular plant, but is assumed to be liquid carbon dioxide rather than gaseous, and in any case would be made to correspond to the point for that particular plant operator.

The Court: Your drawing III simply is the next stage in the cycle: You pull back in any of the gas in the proceeding operation which had come in and been gasified—CO<sub>2</sub> that has become gasified, and has gone out there, and drains back; you take any of that you want; all that is available, and then throw your main stream in from the CO<sub>2</sub> outlet?

A. That is not clear. No gas is obtained from the line entering this at the arrow. It forms no solid. It contributes nothing to become later formed. However, the reason that practice is often followed, in many cases the carbon dioxide source is from an evaporator or shell, in which the liquid is held under its own vapor pressure, and may be a [279] pressure of 80 to 100 pounds per square inch at that point. It is so close to its own freezing point that if released suddenly into the empty press chamber at atmospheric pressure there is a tendency of the carbon dioxide inlet valve to plug up, due to solidification in the valve. This is avoided by having a counter-pressure already present in the cylinder when the valve is opened.

Mr. Foster: I object to the answer of the witness, and move to strike it, as well as his previous testimony about

(Testimony of Charles L. Jones)

these operations, in this diagram No. 3, Exhibit 7 for identification, on the ground that there is no disclosure of these operations in the patent, and there is no distinction in the question between the commercial operation and the operation taught in the patent; it is some operation performed at some undisclosed time and place.

The Court: I don't feel so, Mr. Foster. It doesn't make any difference whether the man who invented the machine knew that was going to happen, or did not know it was going to happen; if it is possible in actual operation, and does actually happen, he gets the benefit of it, doesn't he? Isn't that the fundamental principle of the patent law? This man builds a machine, and it may be at the time he did not realize this was going to happen, but it didn't take very long to find out how to work that, and if it did not change the machine, and this is not a method patent; it is an apparatus patent,—and on cross-examination you may [280] knock this story into a cocked hat.

Mr. Foster: I have no criticism of your Honor's statement, if this is asked of the prior patents.

The Court: Yes; on cross-examination you may be able to minimize the effect of the testimony. I wanted to be sure it was in the record why that was done; that was the reason I asked the question.

Mr. Foster: I was confused, whether it was intended that this witness testify to what was disclosed in the patent with respect to the operation of the apparatus, Fig. 5, or whether he was testifying as to how it could be operated?

Mr. Morris: And adapted to be operated.

The Court: All I wanted him to testify to was what this Fig. 5 shows, and the adaptation to that particular type of machine. It may be that some of these matters



(Testimony of Charles L. Jones)

require explanation. It did not seem to me it was clear from the explanation of the witness, why this drawing III had been introduced as an intermediate step between 3 and 4.

Q. By Mr. Morris: I think in your previous answer you were referring to a triple point operation, were you not, Dr. Jones? A. I was.

Q. And internal pressure in the chamber for the triple point is approximately what gauge pressure?

A. It may be selected at the convenience of the [281] particular plant operator at any point, as long as it is of the triple point. In common practice it is about 80 pounds.

Q. You mean charging?

A. The filling pressure.

Q. What is the difference between charging liquid into a chamber having a pressure of upwards of 60 or 70 pounds and charging that liquid into the chamber at atmospheric pressure?

A. In the first instance the chamber is filled with a bath of liquid carbon dioxide, having suspended therein particles of frozen impurities. In the second instance, a mass of finely divided carbon dioxide snow is directly deposited in the chamber, with the impurities distributed through there.

Q. In making a charge at upwards of the triple point, which I will assume is 60 pounds, or is it above that, Dr. Jones? [282]

A. It is, I think, exactly 5.113 atmospheres, and 60 pounds guage pressure. That is a very fair statement; very close to that.

(Testimony of Charles L. Jones)

The Court: Where did you get to calling this triple point?

A. That is the technical term, and is the correct term for that, denoting the fact that every chemical substance which does not decompose at its triple point has a temperature which is characteristic to that substance. The reason it is called triple temperature is that it is the only temperature at which it can exist at all three phases together in the same vessel, that is, solid, liquid, and vapor. The triple point of water ice is at 32 degrees Fahrenheit, and I can't from memory state the exact pressure of this; it is about 4 millimeters. It is under a vacuum sufficient so that you may have your water and water vapor in equilibrium in the same vessel, under the same conditions. If the pressure is raised it is condensed; if it is lowered it evaporates.

The Court: CO<sub>2</sub> is minus 70 degrees temperature and 5 atmospheres?

A. Yes, or 60 pounds gauge pressure. The reason is this: The layman does not think of water as having a triple point. The accident, if you please, is that the vapor pressure of water, at the freezing point, is only a few millimeters of mercury. Therefore it is unimportant. [283] If the vapor pressure of water at 32 degrees Fahrenheit were appreciable, say five to seven pounds, we would all be aware there was pressure as well as temperature connected with the idea of the freezing point, and would naturally speak of the triple point of water instead of speaking of freezing point.

(Testimony of Charles L. Jones)

Q. In carrying on a triple point operation, what pressure is maintained in the chamber after the discharge is completed?

A. May I ask whether you are now speaking of Figure 5 or Figure 4?

Q. 3.

A. In Figure 3 there is no liquid in the chamber whatever.

Q. Without reference to any figure, in the triple point operation is the charging liquid vaporized as it passes into the nozzle, or is it the effort of the operator to put it into the chamber in liquid form?

A. It is introduced in liquid form.

Q. Can you carry out the triple operation unless it is so introduced into the chamber? A. No.

Q. How does the operator of this press keep it in liquid form while it is being charged into the press?

A. The press inlet, the carbon dioxide inlet and outlet, must be so proportioned that the chamber pressure automatically reaches a pressure above the triple point.  
[284]

Q. And isn't that aided by the open valve in your outlet pipe in No. 3, and your backflow, which is a pressure of approximately what, in No. 3?

A. I answered that question, that the opening of the outlet valve, and the opening of the carbon dioxide inlet, is merely a convenience for the press operator in allowing him to start his operation with less danger of freezing his inlet nozzle.

The Court: Would you read the question?

(Question read by the reporter.)

(Testimony of Charles L. Jones)

The Court: You have approximately atmospheric pressure until you open up that inlet valve, don't you?

A. Correct.

Q. So that answers that part of it. The other part of the question has not been answered yet.

A. Pardon me; I have answered that the valve opening establishes whatever pressure is available in that part of the compression system in the particular plant which ordinarily would be 40 to 60 pounds.

Q. By Mr. Morris: In order to carry out your triple point operation you must have a pressure of 5.113 atmospheres?     A. Yes.

Q. You can get part of that in that way, can you not?  
The Court: In what way?

Mr. Morris: By the backflow of the 40 to 60 pounds pressure. [285]

A. Yes. It is not essential; it is optional.

Q. Suppose you wanted to begin your charge with the valve in the high pressure line closed, instead of open, how would you build up that pressure?

A. The carbon dioxide coming from the CO<sub>2</sub> inlet, vaporizing in the chamber, would quickly build up the same condition.

Mr. Morris: Has your Honor any questions at that point?

The Court: No, that is very clear.

The Witness: Passing then to No. 5, which is marked "End of charging period."

Q. By Mr. Morris: Yes.

A. At this time the carbon dioxide inlet is closed. The position of the plunger and closing head are unchanged; the high pressure outlet remains open; during this phase the compressor system draws down the pres-

(Testimony of Charles L. Jones)

sure in the press chamber to the triple point and continues drawing gas from it until the liquid in the chamber has been partially evaporated, and it may continue, without changing the valve, until the chamber is drawn down, due to atmospheric pressure. However, it is customary, in order to save power, to obtain a high pressure outlet of some definite pressure well above atmospheric, and pump this line down only to a degree convenient to the operator.

[286]

Q. By the Court: You do that by setting your valve on the high-pressure outlet? A. Yes.

Q. Now, if you left that low-pressure outlet open, that would interfere with that operation and you would just waste that, too, wouldn't you? A. That is correct.

Q. Otherwise it would not have any effect?

A. Otherwise it would have no effect at all.

Q. By Mr. Morris: Is the term "boiling off" used in the industry to indicate a certain period of that operation?

A. The common English expressions used in the triple point operation are "the boil off" and "the blow down," signifying the fact that when the inlet valve is closed the pressure reduces rather rapidly until the triple point is reached and then remains stationary until all of the material in the chamber has been solidified. The gauge needle standing stationary at approximately 60 pounds, that is called "the boil off." Then it starts down and goes down very rapidly from that point to whatever lower pressure it may reach, and that is called "the blow down period."

Q. The boil off period, as I understand you, Dr. Jones, is the period during which there is more or less rapid vaporization of the liquid in the chamber?

A. That is correct.



(Testimony of Charles L. Jones)

Passing to No. VI, marked "start of pressing period," [287] the CO<sub>2</sub> inlet remaining closed, in this step the high-pressure outlet has been closed and the low-pressure outlet opened. This operation is schematically shown here as two presumably manually-operated valves. However, in plants operating today this may be accomplished by a remote control, pneumatically-operated valve; it may be accomplished by a pressure-reducing valve mounted on the compressor in such a fashion that when flow stops through the high-pressure outlet the compressor is automatically transferred to the low-pressure outlet; in other instances the low-pressure line is opened to the air or to a convenient part of the process system, where it may be recovered to where it blows away.

Q. I am not sure, Dr. Jones, that the record makes it clear what determines the point at which that high-pressure line is cut off and the low-pressure line, regardless of where it passes, is turned on. Can you help us a little with that? A. Well, I could—

Q. I will be more definite. My understanding is that a high-pressure line is connected with that part of the compressor system that has approximately that pressure; is that approximately right?

A. If by "that pressure" you mean the pressure existing between the first and second stages of the multi-stage compressor ranging from, say, 40 to 60 pounds, that is correct. [288]

Q. Very good. When the pressure in the chamber is less than that what would happen?

A. When the pressure in the chamber—

Q. Is less than that?

A. —is down to that pressure, flow ceases in the high-pressure line and it no longer fulfills any function.

(Testimony of Charles L. Jones)

The Court: When it is below that—below that, it would pull it back if you did not turn the valve off?

A. It can't go below that. That is the limit. That is all there is.

Mr. Morris: That is what I wanted to bring out.

Q. My understanding of it is: Here is a line in the compressor, a line of gas or a pipe of gas in the compressor, just being compressed, Dr. Jones; my understanding is that if that is 40 to 60 pounds, there has been one stage of compression before it reaches that pressure. Now, my understanding likewise is that this blowback line feeds into that 40 to 60 pounds compressor line. Am I right so far?

A. If you mean it is connected with it. You don't mean it feeds into it, I don't think.

Q. Well, connected with it, what is the difference?

A. Well, it is impossible for it to feed anything into a line at higher pressure than its own pressure; and since it is the low-pressure line, nothing ever flows from the low-pressure line to the high-pressure line. However, it is probably— [289]

Q. We are a little bit at cross-purposes still, Dr. Jones.

The Court: I wonder if part of the difficulty is not in the terminology.

Mr. Morris: Perhaps.

The Court: This high-pressure line is a connection between this instrumentality, this Fig. 5, and some compression chamber of some kind, is it not?

A. Correct.

Q. Now, then, when the pressure is higher in the device than it is in the line and the compressor, the flow is toward the compressor?

A. That is correct.

(Testimony of Charles L. Jones)

Q. When they are equalized, it is just like a tube full of water and plugged at both ends; then you turn that off?

A. That is correct.

Q. And the flow stops. When you are going to press you have to get rid of any accumulated gases, and you just throw it out the low-pressure line; is that not correct?

A. That is correct.

The Court: Is that what—

Mr. Morris: That is what I had in mind. And I will make this comment at this moment: On Fig. 3, the pressure in Fig. 3 in the tank being lower in the compressing apparatus, enables that flow to come in. That was all I had in mind. [290]

A. All right. Passing, then, to Figure VIII—

Q. You have not touched VII.

A. Figure VII. I beg your pardon. In Figure VII, marked "end of pressing period," the low-pressure outlet is open, the high-pressure outlet is closed, and the upper plunger is brought down, compressing the charge of solid carbon dioxide into a cake. It might be well to show at this point that the height of the cake is commonly determined by timing alone; that is, the carbon dioxide inlet is left open for a definite time period, a minute, a minute and a quarter, or other period, depending on the temperature and the pressure of the carbon dioxide supplied and the size of the opening, which, by trial and error, proves to give the desired weight of solid in the chamber and therefore the desired height of block.

Q. By the Court: Will they be uniform in a series of operations, reasonably uniform?

A. They are surprisingly uniform when the carbon dioxide supplied is itself uniform in temperature and pressure. Variations of as much as an inch or an inch and

(Testimony of Charles L. Jones)

a half in height were commonly experienced in the early days due to the variations in the temperature of the carbon dioxide fed to the machine. It is unusual now, however, to encounter more than, say, one-half inch variation.

Q. By Mr. Morris: Now, will you pass to Figure VIII—or before passing to Figure VIII, I notice in Figure VII, [291] chart VII, that the plunger is not tight-fitting. Is that deliberate or does it have a purpose in function?

A. That is deliberate, and the plungers in various machines which have been constructed under this design have had from one-eighth to as much as three-eighths inch clearance around the upper plunger for the free escape of gases from the block.

Passing to Figure VIII, which is headed "Block of solid being removed," an intermediate stage of the removal of the block is shown.

Q. Are the plungers following the block down?

A. The plunger following the block downwardly, while the closing head is lowered to open position.

Q. I will now get you to turn to Figure 1 of the patent in suit, Dr. Jones. Do you have that large drawing on that?

No; I gave it to your Honor.

The Witness: All right; I have it here.

Mr. Morris: Very well.

Q. I am sorry, Dr. Jones. Mr. Lyon has called my attention to No. IX.

A. All right. Passing to No. IX, showing block of solid completely removed. This shows the closing head in its final position and a block of solid ready to be pushed out of the mouth of the chamber.

(Testimony of Charles L. Jones)

Q. And then, next, that would be chart I of Exhibit 7? A. That is correct. [292]

Q. By the Court: You do not ordinarily, then, have any operation here where the closing head moves up to cause pressure from the bottom?

A. It is not so illustrated. It was considered to be taken for granted.

Mr. Morris: Dr. Jones made these for me.

Q. What are the papers which I now hand you, Dr. Jones?

A. The first sketch, marked A, is headed "A variation in method of operation of apparatus of the patent in suit." This—

Q. Will you explain that?

A. This shows an optional step in completing the pressing of the block, in which the lower closing head is lowered slightly before the start of the pressing operation and, according to the note I am reading: "At end of pressing stroke of plunger raise closing head to closed position, giving to block a bottom squeeze." This step is optional with the operator and is not always practiced in exactly the same way. Some operators will lower the closing head prior to starting the pressing operation; others will fully press the block with the upper plunger with the closing head in position, and then lower the moving parts of the press a desired distance and apply the bottom squeeze to the lower portion of the block that has already been pressed; still others will say that they are following this practice, and occasionally will make several blocks, or [293] possibly two or three hours-production, and omit the step altogether. And unless you have instructed the operator to use it or know that he is going to use it on the next block, you are never quite sure



(Testimony of Charles L. Jones):

whether this step is going to be included in the operation or whether it is going to be omitted. However, I would like to say that it is always my thought and practice to urge the press operator to include the step in practical operations, because it has always been my feeling that the added density imparted to the lower half of the block is well worth while.

Q. The closing head shown in Fig. 5 of the patent in suit—and I will ask you to turn to Fig. 5 of the patent in suit—has or has not a boss on it as shown in this chart A?

A. It has such a boss. I would like to make clear here, however, that the bottom squeeze operation is in no way dependent on that structural feature, as I have operated presses in which no such boss existed and still applied pressure from the closure head by permitting the block to extend out into the room from the end of the chamber by a definite distance, in which it might be thought that the unconfined material exposed would be pressed sideways or would cause a damaged end on the block, and still obtained a satisfactory product in that way.

Q. Will you point out from Fig. 5 to his Honor what that is in Fig. 5 that is marked 110, or as shown in Fig. 7, [294] marked 111?

A. This part shows two dividing walls or septa which may be placed on the bottom platen for subdividing a block into four portions. This feature was discarded very early for the reason that Cole and McLaren, together with myself, soon found that we had an advance over previous practice in the change in dimensions of the molds on these presses; that is, in changing from a 10-inch cube to a block 20 inches on a side, the proportion of

(Testimony of Charles L. Jones)

the mold wall surface and the volume and weight of the piece being pressed is cut exactly in half, and this decrease of 50 percent of mold wall friction results in a more effective pressure throughout the block and a more uniform density. The same thing is observed in ceramic presses, where a shallow, a thin brick can be very much better pressed than a deep brick.

Q. 110, then, is just the movable—

A. A movable element which is an appendix which disappeared early in the history of the machine and has never made reappearance.

Q. Very well. Now, will you look at chart B—

The Court: Before you do that, let us keep this record clear. Let us admit the nine drawings of Exhibit 7 into evidence for the purpose of illustrating the testimony of this witness, and add thereto as part of the same exhibit, A and B, and they will be given the plaintiffs' next number in order, keeping the eleven of them all together.  
[295]

The Witness: Pardon me, I have made no discussion of B.

Mr. Morris: That will be Exhibit 7, the seven numerical exhibits and two letter exhibits.

The Court: That is right.

Mr. Morris: Nine numerical exhibits and two letter exhibits.

The Court: Nine and two, making eleven all together.

Q. By Mr. Morris: Chart B of Plaintiffs' Exhibit 7, Dr. Jones.

A. This is also headed "A variation in operation apparatus of the patent in suit." It simply indicates that different methods may be employed in the removal of the block, and at the operator's option the plunger may not

(Testimony of Charles L. Jones):

be used to forcibly eject or push the block out of the chamber, but may be retracted to its uppermost position and after a slight delay, the block will melt from the chamber and fall of its own weight to the lower plate.

Q. If you were going to permit it to fall of its own weight would you permit it to fall that far, or would your closing head be close up to the lower end of the chamber?

A. It should be close to the chamber to avoid the shock of being dropped through 10 or 12 inches; but with the product that is being made today it is not uncommon to find an operator who does exactly that, lowers the lower plate and lets the block fall.

Q. What is the dimension of the block ordinarily made [296] in the apparatus that has been used, apparatus of the Fig. 5 of the patent in suit type—question withdrawn. What is the usual size of the block made in the press of the patent, vertical press of this patent?

A. 20x20x10 inches.

Q. And those blocks weigh approximately what?

A. Oh, 210 to 240 pounds, approximately.

Q. Dr. Jones, I will now ask you to turn to Fig. 1 of the patent in suit, and get you to tell me how that shows a high-pressure and a low-pressure line.

A. The patent in suit shows a line 80—

The Court: I do not understand this very well. I will stand over here and watch you. Suppose you use this (large chart) and I will stand here and watch you.

A. All right; I will try. The patent in suit shows the line 80 which carries the outlet carbon dioxide from the press past a heat exchanger, so indicated that it can be included in the system or excluded from it, and passing into diaphragm valve 84 and exhauster 81. Diaphragm

(Testimony of Charles L. Jones)

84 may be any suitable diaphragm valve of the pressure-reducing or pressure-regulating type which maintains a definite pressure in the line 80. Exhauster 81, as originally conceived, was, I believe, a blower, a rotary blower of a positive type, however, which did not permit the free passage of gases through it; Root's blower, I believe, is the common term applied to it. [297]

The gas then passes through an expansion tank 82 and into an outlet line 83 which communicates with a gas holder. The gas holder on the line is an indication that the pressure at that point would have to be very low, that is, whatever the sealing liquid in the gas holder, water or oil, might permit. Therefore we have a pressure in the line 80, regulated at whatever value is permitted by the diaphragm valve 84, and the exhauster 81.

Q. So that you can get a discharge from your chamber of both high pressure and low pressure through the same lines?

A. That, I should say, the structure shown, is adapted to produce that result.

Q. Dr. Jones, will you be good enough to tell me about the snow operation, whether this apparatus is adapted—

The Court: We had better get this identified in the record.

Q. By Mr. Morris: You were referring to Fig. 1 of the drawings of the patent in suit?

A. That is correct.

Mr. Morris: I will offer this as plaintiffs' exhibit, the enlarged diagram, as Plaintiffs' Exhibit No. 8.

The Court: It will be received as explanatory of this witness' testimony.

Mr. Morris: The question is withdrawn.

(Testimony of Charles L. Jones)

Q. Will you, referring to the apparatus illustrated in Fig. 5 of the patent in suit, tell me whether a snow [298] operation may be carried therein, and at what pressures in the chamber, what the product would be, and what other products may be made in the chamber and apparatus of Fig. 5 of the patent in suit?

A. The patent in suit clearly states that Fig. 5 may be substituted for the snow compressing apparatus, so marked, and appearing in Figure 1 of the patent. It is therefore to be supposed that explanations offered with respect to the function of the pipe 80, the diaphragm valve 84, and exhauster 81 apply with equal force to Figure 5 or to snow compressing apparatus shown in Figure 1.

As has already been stated, the apparatus of Figure 5 is adapted to make any of the different types of solid discussed, that is, snow product, and slush product, or the triple point product.

Q. By the Court: Well, to put it another way, is there anything that you can do with the apparatus indicated in Exhibit 6 you can't do with the apparatus indicated in Exhibit 5?

A. No; there is nothing you can do with the apparatus in Exhibit 6 that cannot be done with Fig. 5 of the patent.

Q. By Mr. Morris: Is the converse true?

A. No; the converse is not true. Even when the product of Figure 6, or Exhibit 6, is attempted to be duplicated in Figure 5, a superior result is obtained because the exposure to the atmosphere has been eliminated, [299] the variable moisture content which is introduced by the humidity of the air with Exhibit 6 is eliminated, and the variations due to the human element in tamping



(Testimony of Charles L. Jones)

are also eliminated. I would not leave the impression, however, that Figure 5 is perfect. It is still necessary to so adjust the inlet and the manipulation of the apparatus as to produce a sound block of product. It is perfectly possible to make inferior products on the advanced machine as well as on the older machine.

Q. Are the forces of nature which are applied in this apparatus operating in the raw, or are they under man's control?

Mr. Foster: That is objected to as vague and indefinite and immaterial.

The Court: Well, I think I know what Mr. Morris is getting at. I don't think he has expressed it very well, possibly, for the record.

Mr. Morris: I am again trying to avoid leading questions.

The Court: Go ahead with your leading questions.

Mr. Morris: I am accustomed to the other method. I will get it more directly. That question is withdrawn.

Q. How are the forces released in this apparatus and controlled, and is it necessary to control them to obtain a desired result?

A. Definitely, yes. The pressure existing in the chamber, as has already been stated, is controlled by valves [300] in the outlet and controlled by the design features of the balance of the plant system, elements corresponding to the exhaustor 81 and the diaphragm valve 84 in Figure 1. The rate of input is controlled by means of a valve which is indicated, the temperature of the input is controlled by the operation of one or more heat exchangers, the evaporator coolers, which are indicated diagrammatically or schemetically in the drawing—

(Testimony of Charles L. Jones)

Q. Is tamping—

The Witness: Pardon me, I had not finished.

Mr. Morris: I am sorry.

A. The application of hydraulic pressure is controlled by means well known in the art and not, I think, claimed particularly by the present patentees. The sequence, the cycle of operation, is under definite control of the operator, and we have just described various variations of the normal method of operating that.

Q. Is tamping eliminated by the apparatus of Fig. 5 of the patent in suit? A. It is.

Q. Is the handling of the uncompressed, unpressed product with that apparatus in the atmosphere made unnecessary? A. It is.

Q. Are the losses incident to such tamping and putting into an open mold and pressing, as you describe it, in connection with the snow tank—are they eliminated by this [301] apparatus of Fig. 5 of the patent in suit?

A. I would say that they are eliminated by the use of that apparatus, with the qualification that a part, but not all of them, are eliminated. If the scheme marked "a variation" involving the lowering of the closing head in order to give the bottom squeeze, or the opening of the low-pressure outlet for unsolidified gas to the atmosphere, in case it happens to be convenient in the particular instance to do those things, then only a part of the losses are eliminated.

Q. What definite pressures may be used in the apparatus of Fig. 5?

A. Well, I don't know of any limitation except strength of the machine. They have used in that apparatus in order to prevent too violent boiling, in some of the first trials where the liquid supplied was only avail-

(Testimony of Charles L. Jones),

after it once attains it during the triple point boil-off period?

A. Yes; it does. That pressure is not an absolute constant for all different plants, because it varies with the impurities that are present; that is, if a considerable amount of air is being pumped through the system from the source of the carbon dioxide, or if there might be, as there sometimes are, hydrocarbons, ethane, ethylene, acetylene, and other materials associated with that carbon dioxide, they will vary the triple point in the same way that dissolving salt in water will vary the melting point of water. Those variations are minor, however, and in general it remains constant.

Q. And automatically so? A. Automatically so.

Q. After the pipes have been once adjusted?

A. Yes.

Q. Why is that true, Dr. Jones?

A. Well, that is a factor of nature, no other explanation.

Q. If it boils more rapidly, does the pressure build up?

A. No; the boiling rate is entirely independent, regardless of whether it boils off rapidly or slowly, or whether filled with slush, filled with liquid, and then boiled down; the boil-off pressure is the triple point pressure.

Mr. Morris: Very well. Does your Honor find this a convenient time for your afternoon recess?

The Court: Yes; we will take it now.

(Short recess.) [305]

Q. The operations described by you of the apparatus marked 5 of the patent or the operations that you have seen personally from time to time, or not? A. Yes.

Mr. Miketta: I object to that, your Honor, as being ambiguous.

(Testimony of Charles L. Jones)

The Court: Objection sustained. I don't know what the question means. Read it, please.

(Question read by the reporter as follows: The operations described by you of the apparatus marked 5 of the patent or the operations that you have seen personally from time to time, or not?)

Mr. Morris: That should be "are."

The Court: I thought it was "or" instead of "are." You understood it to be "are"?

A. Yes. I understood it to be a-r-e.

Q. By Mr. Morris: You reminded me, Dr. Jones, at the recess that you did not complete your employment at the beginning of your testimony. Where did you leave off, do you remember?

A. I failed to state at the present time I am under a retainer from International Carbonic.

Q. One of the plaintiffs in this case?

A. I believe so, yes.

Q. In what capacity are you under a retainer from International Carbonic? [306]

A. I was employed by them as a consultant.

Q. You had been so employed since when?

A. About 1938; nearly six years.

Q. What is your further occupation, Dr. Jones, at the present time?

A. I believe that has already been stated; with the Sterling Steel Corporation.

Q. I had understood you had not stated.

A. I believe that is in the record.

Mr. Morris: That is all.

(Testimony of Charles L. Jones)

Cross-Examination

Q. By Mr. Foster: In order to fix the dates in my mind, Dr. Jones, you received your doctor's degree, as I understood it—was it in 1923?     A. That is correct.

Q. What was the nature of your treatise, your doctor's treatise?

A. My doctor's treatise was submitted of some work done for the Gulf Refining Company, and was on the subject of oils from oil shales and low grade bituminous coals.

Q. You mentioned last your employment by one of the plaintiffs. While you were employed by the Dry Ice Corporation of America did you participate in the preparation for trial or in the trial of the case of American Patents Development Corporation v. Carbides?

A. I did. [307]

Q. Were you the patent expert for the plaintiff in that case?

A. I gave testimony for them; I suppose I was a patent expert, yes.

Q. That was for the plaintiff?

A. You are really taxing my memory now. I don't know which one of the plaintiff—yes, it was the plaintiff; correct.

Q. At the time the plaintiff was the Dry Ice Corporation of America?     A. Yes.

Q. That was the time you acted for the plaintiff as a patent expert?     A. That is correct.

Q. As I understand it, later there was substituted in the case the American Patents Development Corporation as the plaintiff?

A. I don't remember the proper date.

Mr. L. S. Lyon: I object to that.



(Testimony of Charles L. Jones)

The Court: Sustained.

Q. By Mr. Foster: You have acted as a patent expert in a number of infringement cases, haven't you, Doctor?

A. No, I wouldn't say that. I, in fact, only recall one other instance in which I have been an expert in a patent infringement suit.

Q. I wish to inquire about the state of your knowledge [308] prior to May, 1928, in the field relating to carbon dioxide. You had learned something about that material, I presume, during your college days?

A. That is correct.

Q. You referred, in your direct examination, to the book of which you were co-author, entitled "Carbon Dioxide." I note that on page 196 of that work there appears, a little above the middle of the page, the statement: "The starting point in the development of solid carbon dioxide manufacture is the simple cycle used for many years in the preparation of solid carbon dioxide for the laboratory. Liquid carbon dioxide, made by any of the methods already described, is expanded into a bag made of cloth or chamois leather and heat of vaporization, taken largely from the liquid converts part of it into 'snow.' The yield of 'snow' obtained by this method naturally depends upon the initial temperature of the liquid and the efficiency of the heat transfer during the reaction." Had you seen carbon dioxide snow formed in the manner described in that portion of your book, prior to May, 1928?

A. Yes, it was familiar to every college student and probably to most high school students.

Q. Isn't it true that it was also common to your knowledge in the laboratory prior to May, 1928, to form

(Testimony of Charles L. Jones)

carbon dioxide snow with a mechanical device which was releasably connected to a cylinder of liquid carbon dioxide? [309]

A. Yes. I don't know whether you want me to expand the answer.

Q. You may continue.

A. My interest in solid carbon dioxide was first aroused after leaving school, by being assigned to do some work on a hand fire extinguisher for the Bell Telephone Company of Pennsylvania. It was quite a problem then, and that involved developing a discharge device, a horn, a nozzle, and a valve mechanism, which has since that time become standard fire extinguisher equipment in telephone exchanges. The characteristic of that, however, is that it does manufacture snow in copious quantities, and uses that as a means of extinguishing fires.

Q. When did you see that, Doctor? A. 1922.

Q. It was used in that year, was it, for that purpose? A. Oh, yes.

Q. Prior to May, 1928, you understood what you have explained as the triple point of carbon dioxide, didn't you? A. Oh, yes.

Q. That is, the temperature and pressure conditions of the triple point were generally known?

A. That is correct; known for many years.

Q. You had yourself, prior to 1928, evaporated liquid carbon dioxide, and caused a portion of it to be converted into a gas and a portion of it into a solid? [310]

A. That is correct.

(Testimony of Charles L. Jones)

Q. Prior to that time it was commonly known that variations in pressure conditions caused variations in properties of solid carbon dioxide, isn't that true?

A. No, I wouldn't say so. I don't think I knew myself what the differences between so-called slush and snow and solid products were until I actually made such products, and I did not actually make anything of the kind until the fall of 1928, and even then I would say that even after the introduction of the device we are discussing here, there was a period of not a short time, but several years, when we were still learning there was a great deal yet to be known about the properties of solids. I doubt if it is all known yet. For example, this year I understand there is going into operation a small plant in Mexico which takes its source of carbon dioxide from a natural well containing some 6 or 8 per cent of hydrocarbons in the raw material. I think possibly there will be a great deal of technical work to do until they will be at all sure they are going to make the same grade of solid and the same grade of commercial properties from it that are desired.

Q. Had you, prior to May, 1926, seen any device for compressing carbon dioxide snow?

A. Prior to what date?

Q. May, 1926.

A. May, 1926? I will answer that by saying only [311]laboratory devices or small devices intended for making pellets of the material.

Q. I will direct your attention to the patent of which plaintiffs' counsel has a copy—and may I hand it to the witness?

The Court: Yes.

(Testimony of Charles L. Jones)

Mr. Foster: For the purpose of facilitating this examination, and I will ask you if it is devices such as disclosed in patents 955,454 and 1,018,568, that you referred to in your last answer?

Mr. L. S. Lyon: I object to that as not cross examination, your Honor. I don't think it is part of the plaintiffs' case, and an examination of the plaintiffs' expert, who has not been interrogated about these prior patents, is improper cross examination.

The Court: He is not interrogating him about the patents. He is simply asking him if the devices he had seen were similar to those. It is for an entirely different purpose. Objection overruled.

A. May I have the question again? Did you ask me, were they the same, or did you ask me were they similar?

The Court: Read the question.

(Question read by the reporter.)

A. It was devices similar, in a general way, to those, but not identical with the patent drawing.

Q. By Mr. Foster: Did those devices, to which you [312] referred, Doctor, as having seen prior to May, 1926, for compressing carbon dioxide, include a chamber in which the snow was formed and subsequently compressed into a product?

Mr. L. S. Lyon: I object to this line, your Honor, as attempting to go into the prior art.

The Court: He is testing his knowledge of these things. He is asking him only a question as to his experience. He is not talking about the prior art in this question. The objective is simply testing the knowledge

(Testimony of Charles L. Jones),

of the witness and the accuracy of his testimony on direct. Objection overruled.

A. My answer is no; the only device that I had seen prior to that time was a device of that class known as the Goosman snow pencil forming device. It had a perforated receptacle at the outlet of the cylinder, and I believe at one time it was supposed to have been adapted for compressing, but it was not so used. We had one of those in the laboratory, and formed a pencil of carbon dioxide snow merely by filling this perforated container, in the same way as a canvas bag would be, forming a cylinder of liquid  $\text{CO}_2$ .

Q. Did this device you have referred to as the Goosman device have means for compressing carbon dioxide snow? A. Not the device we used, no.

Q. Had you seen such a device prior to May, 1926, [313] having means for compressing snow?

A. That is quite a memory test. I don't believe so. We never had a compressing device in the one we used. We merely filled the compression chamber, and the cylinder took care of compressing it. It was, however, compressed, and the carbon dioxide in the cylinder produced a fairly compact pencil of fairly good mechanical properties; good enough that it was used for many years in the medical arts without any question of requiring any further compression.

Q. Prior to May, 1926, you had, in the course of your studies at the university, and your subsequent activities in the industry, studied the literature in this carbon dioxide field, hadn't you, Doctor?

A. That is correct.



(Testimony of Charles L. Jones)

Q. And are you able to state, as a result of such study, that you knew, prior to May, 1926, that the literature disclosed devices which include a chamber in which carbon dioxide is formed by the evaporation of the liquid, and in which it is compressed?

A. Yes, I think there were varying disclosures.

Mr. L. S. Lyon: I object to the witness being asked what was disclosed in the literature, as not a proper method of proof.

The Court: Objection sustained. You may ask him what he knew, but whether it was disclosed in the literature is not proper on cross examination. [314]

Q. Did you, prior to May, 1926, Doctor, have knowledge, know of, a device in which carbon dioxide snow was formed by the evaporation or expansion of the liquid carbon dioxide, and in which the snow was compressed?

A. In the same chamber?

Q. Yes.

Q. I had never, to my knowledge, seen such a device. I did not know of any machine or such a suggestion which could escape being called a casual or purely laboratory use of it, unless it might be the suggestion that I myself made to the carbon dioxide manufacturers, in 1924, and I do not believe that I had gone so far as to include that step at that time.

Q. You do recall that the idea had occurred to you, in 1924 or earlier than 1924, of such an operation and device, is that correct?

A. I am very much afraid you are trying to put something into my memory that does not seem to be there. I made the suggestion that carbon dioxide might be solidified and sold by my employers, frankly, only after the idea had already been reported to me as having been, if

(Testimony of Charles L. Jones).

not accomplished, at least proposed by the Pressed Air Corporation in New York City. In other words, they, and not I, were the originators of the idea that solid carbon dioxide, instead of being merely a laboratory curiosity, might become an article of commerce. I was told that they did compress [315] the blocks. I was shown photographs which showed some of the blocks. Whether they were compressed in one chamber or in a dozen, or whether they were made by hand or machine, I had no knowledge at the time, and no connection with the industry until some years later. They may have been. I don't know.

Q. Let us fix the time when you learned of this contention or suggestion that solid carbon dioxide should be compressed in blocks and sold as an article of commerce. When was that?

A. I would say that was in 1924, in the summer of 1924. I could not give you an exact date. I don't believe I know.

Q. When did you first see a press which was adapted for compressing solid carbon dioxide? [316]

A. In the Maspeth plant of the Liquid Carbonic Corporation, in Long Island, in 1927. That was in yesterday's testimony.

Q. Can you fix the time in 1927?

A. I am afraid I can't exactly. I believe it was in the fall.

Q. And that press was in operation?

A. That press was in operation.

(Testimony of Charles L. Jones)

Q. You, in your direct examination, referred to the ceramic industry, and presses employed by that industry. Do you have a knowledge of such presses?

A. Oh, yes. Between the time of the completion of the liquid carbon dioxide investigation, at the Mellon Institute, and the employment with the Dry Ice Corporation of America, in 1927, I was engaged in the ceramic industry, and was very much occupied with such presses.

Q. I direct your attention to this set of three diagrammatic drawings, which is marked Defendants' Exhibit A for identification. You had observed in the ceramic industry at that time, had you not, a press such as is illustrated in the view A?

Mr. L. S. Lyon: I object to that upon the ground that it is not cross examination, and is not material to any of the direct examination, whether the witness ever saw such a press in the ceramic industry, or not.

The Court: Of course, it is pretty hard to tell whether [317] the cross examination is designed to test the knowledge of the witness. So far as proof of the truth of the statements is concerned, in order to prove the defendants' case, it isn't of much value, but I think for the purpose of testing the knowledge of the witness—he has gone into it pretty fully—the question is sound. With that limitation you may answer.

A. I will answer that in this way—

Mr. L. S. Lyon: I would like to suggest to the court that his knowledge of the ceramic industry is not material at this stage. It was not gone into on direct examination. If he did or did not know anything about the ceramic industry would not make any difference.

The Court: It is like the grinding of corn in a coffee mill. It is not the corn or coffee that amounts to any—

(Testimony of Charles L. Jones)

thing; it is the mill. It is not the ceramic or carbon dioxide that amounts to anything; it is the press he is inquiring about. If he limits it to presses, regardless of what they are used for, I think it is proper to test his knowledge. I don't know about the form of the question. I think the subject matter can be reached.

A. I would like to answer this way: I had seen a variety of presses employed for a variety of ceramic products, and at the time was impressed with the lack of success in attempting to make any ceramic product unless it was so filled into a mold, so formed, so pressed, so handled in a [318] press adapted to the material being handled, and so processed in all its subsequent stages, that the finished product was handled in the manner adapted to processing raw material. For example, in the manufacturing of a silica brick it was necessary to tamp the brick mixed into the mold, a limitation which the brick industry is still struggling to avoid, and still without success. It is necessary to tamp every silica brick mold before the pressing operation takes place. My answer is yes, I have seen presses.

Mr. Foster: That was not exactly the question. In your varied experience, Doctor, you did see presses such as that diagrammatically illustrated in this diagram A of Defendants' Exhibit A for identification, that is true, isn't it?

A. No, not exactly. That bears a superficial resemblance to the silica brick press, with the exception that the lower construction of the closed chamber would never be acceptable. There would be no bottom in such mold; because the ceramic material would quickly clog it and destroy it. It would be a four-sided mold, with a bottom

(Testimony of Charles L. Jones)

plate, being easily withdrawn therefrom, so it would be self-cleaning.

Q. With that qualification your answer is yes?

A. It is that it bears a superficial resemblance to that diagram.

Mr. L. S. Lyon: I object, when the witness answers no, [319] to saying: With that qualification your answer is yes.

The Court: He has straightened that out.

Q. By Mr. Foster: When did you first see a press which included a chamber with a movable or removable lid or head and a plunger capable of compressing material in that chamber against that lid or head, Doctor?

A. Am I to suppose that that refers to a gas-tight chamber in which the operations are performed, that involves the materials under pressure, or am I to take it counsel means any—

The Court: You are not to suppose anything. Just read the question.

A. Read it again, please.

(Question read by the reporter.)

A. It is difficult to say. Certainly before 1920.

Q. By Mr. Foster: When did you first see such a device, which was capable of operating with the contents of the chamber under pressure?

A. I am not allowed to object to a question, am I?

The Court: No. I assume what he means is that the chamber was sufficiently sealed so there was pressure in the chamber above atmospheric pressure.

A. Does he mean gas pressure? When you say a thing is a press, is presupposes pressure is to be used in it; otherwise it is not a press at all. So I would say all the presses I have ever seen exerted pressure. [320]



(Testimony of Charles L. Jones)

Q. By Mr. Foster: And such presses, in which the contents of the press were in fluid form,—when did you first see such presses as that? A. Fluid?

Q. Yes.

A. That is still a different art. I think probably Bakelite presses. I find some difficulty in saying when I first did see a Bakelite press, pressing plastic parts. I should say prior to 1920.

Q. In these presses that you have been referring to in your answer to the last questions, and which you saw prior to 1920, I understand that in some of them that Bakelite or similar plastic materials were compressed, that is correct, isn't it? A. That is correct.

Q. What other materials were compressed in those presses to which you are referring in this last answer?

A. Ceramic tile presses, brick presses, plastic material presses, cottonseed presses, I know of no contention or no mystery connected with the idea. There are lots of presses. Really, I would have great difficulty in cataloguing just when and where, in the course of my life, I ever happened to see a press. It is a frequent occurrence.

Mr. L. S. Lyon: I submit that so far as exhibiting whether or not the witness had any knowledge of presses is concerned, prior to 1926 and 1927, whenever the date is, that [321] the examination has gone far enough. I remind the court again that this is not proper cross examination, or the place or time to develop anything except the knowledge of the witness. I think there should be some limit put on that, if he still has any doubt as to whether this witness knew of any presses or not. I think the examination has gone far enough to show he

(Testimony of Charles L. Jones)

knew enough about presses to be able to testify to what he did.

The Court: As I indicated, the only thing I think you may properly be permitted to do is to lay the background. Of course, you can't prove your case affirmatively by cross examining the other fellow's witnesses. Ordinarily if you are going back into the prior art, if you are just laying the foundation as to what this man had by way of background, a certain amount of it is proper, but I agree with counsel; I think you have got the background now, and you ought to get right into the subject of the direct examination.

Mr. Foster: Very well, your Honor.

Q. You referred in your direct examination further to your work on carbon dioxide with the Mellon Institute for the Compressed Gas Manufacturers Association. What was the nature of your work there? What did you do?

A. I did laboratory work; maintained contacts; carried on correspondence with other industries, at points where we hoped we might be able to find new uses or new outlets for liquid CO<sub>2</sub>. The first approximately three months of that [322] period I spent attempting to put out a coal mine fire with liquid carbon dioxide, with success which is a moot question. The coal mine was still on fire when we quit. [323]

Q. Wasn't the object of your work to find new uses to be made of products to be made from liquid carbon dioxide? A. That is correct.

(Testimony of Charles L. Jones)

Q. Your employers, the association which was your employer, constituted a substantial number of manufacturers, did it?

A. I believe at that time there were 49 different manufacturers in the United States, and 18 of them I think contributed to that research fund, and the 18 seemed to have 18 different opinions about everything they wanted to do, so after two years they agreed to disagree, and discontinued their program.

Q. Those years you were at the Institute were 1922 and 1923?

A. That is correct, and a portion of '24. Two years only.

Q. What was being done by the industry with liquid carbon dioxide being manufactured at that time? Was any of it being used as a refrigerant?

A. Very little; I should say about 5 per cent of the output in the industry was sold for recharging commercial carbon dioxide refrigerating apparatus of the ordinary commercial type. It was mainly air-cooling, and building-cooling.

Q. What was it being used for in the main?

A. Something over 75 per cent of the output was used [324] in carbonated beverages.

Q. What new uses did you recommend for carbon dioxide as a result of your investigation? Did you include a recommendation with respect to its use as a refrigerant?

A. Yes, I did.

(Testimony of Charles L. Jones)

Q. And in solid form? A. Yes.

Q. Did your suggestion include the suggestion that this solid carbon dioxide be compressed?

A. Strangely enough it did not. It should have included such a suggestion. It is only logical that having already seen pictures of a compressed product, already sold by someone else, that the idea must have been somewhere in the picture, but I was primarily concerned with trying to arouse some interest among these people who were in the industry, in the possibility of doing anything at all about it. I never ever had in the slightest degree suggested it. I never got that far.

Q. As a matter of fact, Doctor, probably the reason you did not suggest the impression was that prior to those years, 1922 and 1923, you had observed the formation of carbon dioxide snow under such conditions of pressure and temperature that it was a rather coherent mass.

A. No, I would rather state that at that time it did not seem to me to be a problem at all. It seemed to me, as it would to any layman, that that was just a mere [325] matter of detail: that you could take that material, like so much sand, or so much brick stock, or anything else, and just to sit in a mold, and press it in any kind of press. It did not seem to be worth discussing as a problem. It was not until I entered the industry that I discovered some of the difficulties in handling the ma-

(Testimony of Charles L. Jones)

terial. I was awaked to the fact that a business which was superficially very simple, sometimes presents complications.

Q. Was it your prior knowledge of these presses used in molding ceramic brick, and so forth, which caused you to feel the problem or means of pressing solid carbon dioxide into bricks or blocks was so simple that it didn't need to be mentioned?

A. I don't know. I think I would rather say it was not knowledge at all; that it was ignorance which caused me, to think that.

Q. Would you say your conviction was based upon your knowledge of these prior presses to which you have referred, Doctor?

A. That is an analytical question. I really don't know. It didn't impress me at the time as a problem; it never seemed that it would be a problem until I attempted to do it. Then I discovered it was a problem.

Q. In 1923 you left the Mellon Institute, did you?

A. 1924.

Q. It was not until 1927 that you went to the Dry Ice [326] Corporation of America?

A. That is correct.

Q. In the intervening three years were you concerned with any problems relating to the production of solid carbon dioxide or its compression?

A. Not in any way.

(Adjournment was taken until Tuesday, May 9, 1944, at 10 o'clock a. m.) [327]



Los Angeles, California, Tuesday, May 9, 1944;  
10:00 A. M.

(Parties present as last noted.)

The Court:    You may proceed.

CHARLES L. JONES,

recalled.

Cross-Examination

resumed.

Q.    By Mr. Foster:    Dr. Jones, as I understand the facts, carbon dioxide can be liquid at room temperature of about 20 degrees Centigrade or 68 degrees Fahrenheit if it is subjected to sufficient pressure; do you agree?

A.    That is correct.

Q.    And that pressure is in the neighborhood of 817 pounds to the square inch; would you agree with that?

A.    I would.

Q.    Normally gaseous substances, for example, hydrogen has a critical temperature below 100 degrees Centigrade, doesn't it?

A.    Below 100 degrees Centigrade plus or minus?

Q.    That is minus.

A.    Minus 100 degrees Centigrade?

Q.    Yes.                    A.    Yes; it does.

Q.    And hydrogen, therefore, cannot exist as a liquid at room temperature, irrespective of the pressure to which it is subjected; do you agree with that? [328]

A.    Surely.

Q.    And the same thing is true of oxygen?

A.    Correct.

Q.    And nitrogen?                    A.    That is right.

Q.    And helium?                    A.    That is right.

Q.    And methane?                    A.    Correct.

(Testimony of Charles L. Jones)

Q. Do you agree, then, with the statement that carbon dioxide has physical properties distinguishing it from other common normally gaseous substances?

A. I can only answer that in one way, knowing what the purpose of the question is; and that would be to say that there is a very large number of materials which are not pure compounds but mixtures of carbon dioxide with other substances. For example, at one time we mixed ethylene oxide, which is a fumigant, with carbon dioxide. They are both vapors, both chemical substances. They are, in a sense, a liquefied gas, although it is not a pure compound or a common substance. That mixes and readily forms a block which is essentially carbon dioxide with another material mixed with it and which is quite suitable for fumigation purposes.

We also made experimentally mixtures with—

The Court: Wait. Let us stop there. When you mixed the carbon dioxide with the ethylene oxide the reason that it [329] responded was because of the characteristics of the carbon dioxide, was it not?

A. That is correct.

The Court: All right; go ahead.

Mr. Foster: My question, Doctor, is directed to normally gaseous substances. Let me ask you another question.

The Witness: A common—

The Court: I think he has not answered. I interrupted him.

Mr. Foster: I beg pardon.

A. Of the common gases only nitrous oxide behaves in a manner similar to carbon dioxide. There are, however, many other materials which are gases and which,

(Testimony of Charles L. Jones)

in admixtures with carbon dioxide, will form a block in the apparatus in question. So it seems to me that you are up against the necessity of defining whether compressed or liquefied gas limits you to say that that class can only include commonly known simple gases, or whether that includes any material which has those characteristics that can be solidified in the press. I don't know the answer.

The Court: Let me ask one more question: Doesn't the result, so far as nitrous oxide or carbon dioxide are concerned, in combination with these others, depend largely upon the percentage of the injection of the foreign gas? If you increase it above a certain point, you can't accomplish the results, can you? [330]

A. That is pretty complex. For example, one of the proposals that was made along that line was the use made by the manufacturer of chlorpicrin. Chlorpicrin is not a gas at all at normal temperatures; it is a liquid, with a very high vapor pressure and a strongly irritant effect, and poisonous properties. We find a quite wide range of percentage of carbon dioxide. We get a block that is a solid block, and it is cold. The chlorpicrin did not contribute at all to any refrigerating qualities of the block, but that was not the object. The carbon dioxide merely kept the temperature down so as to keep the vapor pressure down, and we found that the material could be handled with rubber gloves in an open room by a man without a gas mask, which is of some advantage in handling materials of that kind, which are used for soil fumigation. The project was abandoned and never used commercially, largely because of the fear that in handling and transportation, if some of that material were left neglected, or failed of delivery at a specified time, and stood around

(Testimony of Charles L. Jones)

until the temperature raised, and the carbon dioxide was dissipated, you then would have a highly poisonous material with no protection at all for the people who were handling it. However, I feel that carbon dioxide, where it does contribute to the functioning of forming a solid block, is capable of admixture with a very numerous class of substances to form compounds of possible usefulness. [331]

The Court: You haven't answered my question; you have answered all around it. In every one of those cases, if you increase the percentage of the foreign product beyond a certain mark the effect of the carbon dioxide is taken away? It is the carbon dioxide that gives that effect?

A. That is correct.

Q. The same would be true of nitrous oxide?

A. That is correct.

Q. By Mr. Foster: I understand, when we speak of reducing the pressure upon a liquid gas by adiabatic conditions it is meant we reduce the pressure without the addition or subtraction of heat from the system, is that correct?

The Court: What do you mean by adiabatic?

Mr. L. S. Lyon: I think for the purpose of the record I should object to the form of the question. It is a common discrepancy upon cross-examination, but what counsel is asking the witness to do to answer as to counsel's understanding. It does not ask him as to the fact. He wants the witness to testify whether he understands something or not.

The Court: It may be that the form is not proper. Explain to me first the meaning of the word adiabatic.

A. Adiabatic means expansion following reduction in pressure without addition or subtraction of heat, due to the material.

(Testimony of Charles L. Jones)

The Court: Ask him the question.

Q. By Mr. Foster: What is the meaning of the term "adiabatic [332] condition" as applied to the release of pressure upon a liquefied gas, Doctor?

A. It means expansion accomplished without change. I am going to make a suggestion in order to simplify the terminology. The common expansion of carbon dioxide in this process is a constant total heat expansion, which means, so far as possible there is no change in the total heat of the system; nothing added to it, or taken away.

Q. By Mr. Foster: If we, under conditions of constant total heat, reduce the pressure upon the liquid carbon dioxide to the pressure of one atmosphere, or about 15 pounds per square inch, then this liquid carbon dioxide is converted into solid, and part to gas?

A. That is correct.

Q. Is that true of any other normal gaseous substance, to your knowledge?

A. Yes, indeed, that is true of all other normal gaseous substances, depending only upon the pressure. It so happens that atmospheric pressure is 14.7 pounds, but in the case of water ice a method of making water ice is used in exploration in the tropics, where it is not easily obtained, by taking along a little machine which consists of a vacuum pump, and a Mason jar, and you put a half a teacupful of water into the Mason jar, and turn the crank, and the turning of the crank at the same time agitates the water in the jar, and in two or three minutes you have ice, exactly the same phenomena of [333] constant total heat expansion of liquid water in the water vapor; a portion is converted into solid and the balance to gas, and the explorer takes the ice and uses that for whatever explorers usually use ice for.



(Testimony of Charles L. Jones)

Q. That is done with a pressure upon this water vapor of 14.7 pounds per square inch? Do you wish the court to believe that?

A. No, indeed; it is the pressure obtained in the art; it is the definite pressure; not atmospheric pressure.

Q. I wish you would attempt to confine your answer to my question, and we will get along better. You have told the court that if under conditions of constant total heat the pressure is relieved upon the liquid carbon dioxide, and the pressure is reduced to atmospheric pressure, a portion of it is converted to solid and a portion to gas. Do you know of any other normally gaseous substances, in which that constant total heat expansion would produce that result?

A. At that pressure, no.

Q. In all of the apparatus which you have referred to on your direct examination for making a solid CO<sub>2</sub>, there was, if I recall your testimony correctly, an inlet for liquid CO<sub>2</sub>?

A. That is correct.

Q. Have you ever seen a practical apparatus for making solid CO<sub>2</sub> which did not have such an inlet? Would it, in your opinion, be possible to have a practical apparatus for making solid CO<sub>2</sub> without such an inlet? [334]

A. Yes.

Q. Would you describe how that apparatus would be constructed and operated?

A. Of course, I would be quibbling, frankly, with terms. There is, however, I think one patent in the art that shows a single pipe connected to the solidification chamber, and it uses that pipe for both purposes, using it as an inlet on part of the cycle, and then, without altering the pipe in any way, a valve is closed in the by-pass of the compressor, and gas is withdrawn through the same pipe,

(Testimony of Charles L. Jones)

which is the inlet. However, there must always be some way of getting the liquid gas into the chamber.

Q. In order to have a practical device?      A. Yes.

Q. Do you recalle the name of the patentee to which you refer?      A. Yes, the Slate patent.

Q. You consider the construction you describe, as disclosed in the Slate patent, a practical device, I take it, from your answer?

Mr. L. S. Lyon: I don't think there should be any cross-examination as to the Slate patent.

The Court: No; I don't think it makes very much difference. He says it is theoretically possible, in any event, in the laboratory, and experimentally. A rose by any other name is just as sweet, and an inlet is an inlet, [335] regardless.      A. Yes.

Q. By Mr. Foster: In all of the apparatus for making solid CO<sub>2</sub>, to which you have referred on your direct examination there is, if I recall your testimony correctly, an outlet for the CO<sub>2</sub> gas, is that correct?

A. That is true, an outlet, in the broad sense of some way for the gas to escape, yes.

Q. Have you ever seen a device that successfully makes solid CO<sub>2</sub>, without such CO<sub>2</sub> gas outlet?

A. The familiar canvas bag, which was demonstrated in this courtroom last Wednesday, I believe will illustrate the difficulty I have in answering that question. There was an escape for the carbon dioxide gas, but I don't know just how that would be defined as an outlet, in a case of that kind. There must be a means for the escape of the carbon dioxide.

(Testimony of Charles L. Jones)

Q. In order to have a practical device for the making of solid  $\text{CO}_2$ , is that correct?

A. That is correct. I would like to add that there is in the patent art a number of devices based on the freezing of liquid carbon dioxide, the same as with water freezing. It is possible to make solid carbon dioxide by taking a glass tube and immersing it in air, and there you have the formation of a solid without either an inlet or an outlet. I don't think I would be quite bold enough to state that either one of those processes is commercially practical.  
[336]

Q. In respect to all apparatuses in which solid  $\text{CO}_2$  is made by reducing the pressure upon the liquid, where part is converted into a solid and part gas, it is necessary, in order to have a practical device, that we have means for withdrawing or permitting the escape of the gaseous  $\text{CO}_2$ , is that correct?

A. That is correct.

The Court: Now, let me see. We take even this tube in which you accomplish your purpose, one of two things has to happen, has it not: Either you would ordinarily say the surplus product continues in the container until it is opened, or it would be incorporated in the product in one form or another, or some of one and some of the other?

A. No, sir. The liquid would be frozen in the same manner that water is frozen in the water-ice tank, and what is called the unsolidified portion of the gas in the patent in suit would be frozen with the balance of the gas, so that all of the carbon dioxide in the tube could be frozen to a solid.

(Testimony of Charles L. Jones)

Q. That is one of the two things. In your opinion, it is incorporated within the product?

A. In solid form.

Q. In solid form. And there would be no surplus in the gas which would escape when you opened the tube?

A. That is correct.

Mr. Foster: One question to be sure that I understand [337] this reference to the prior art disclosures to which you have referred as making a solid CO<sub>2</sub> as water-ice is made.

Q. In that process there is no expansion of the liquid. Co<sub>2</sub> into a gas? A. There is not.

Q. It is merely a matter of subjecting a liquid CO<sub>2</sub> to sufficient pressure and a sufficiently low temperature to cause it to solidify? A. That is correct.

The Court: Well, that is what I was getting at, better expressed.

Mr. Foster: I am sure the court understood it but I was not sure that I did.

The Court: I did not state it very well.

Q. By Mr. Foster: You have referred in your direct examination to the operation of the snow chamber prior to Cole and McLaren, and, as I understood it, there was near the snow chamber a press for the snow; there was near the snow chamber a press for the snow?

The Witness: I don't understand the question at all. Will you read it back, please?

(Question read by the reporter.)

Mr. Foster: Isn't the question clear, Doctor? I don't mean to confuse you.

The Witness: No.

Mr. Foster: If it is not clear— [338]

(Testimony of Charles L. Jones)

The Witness: You are speaking of a description of the snow tank method?

Q. Yes; that is right. A. The answer is "Yes".

Q. If my question is not clear, do not hesitate to say so, Doctor. I do not mean to confuse you. I may, through my lack of knowledge of the terms in this art, unintentionally do so.

The Witness: All right.

Q. In the operation of that apparatus which you observed, the operation of the snow chamber, or snow tank, you called it, didn't you? A. Yes.

Q. —that operation of the snow tank was not affected in any way by the proximity of the press, was it?

A. No.

Q. That is, the snow tank operated entirely independently of the press and was not modified or affected in any way by the operation of the press?

A. That is correct.

Q. And conversely, it is true that the press operated entirely independently of the snow tank?

A. That is correct.

Q. And the pressing operation that was performed by the press was in no way modified or affected by the proximity or operation of the snow tank? [339]

A. That is correct.

Q. You referred in your direct examination to Plaintiffs' Exhibit 8 which, as I understand your direct examination, discloses as now chamber 50 and a compression chamber 60, is that correct?

A. I did not refer to them in my direct examination, but that is correct.



(Testimony of Charles L. Jones)

Q. In that apparatus illustrated in Plaintiffs' Exhibit 8 the snow is formed in the snow chamber 50 at a time different from the time that the plunger is operated in the compressing chamber 60, is that correct?

A. I don't recall any such statement in the patent. I don't think I can really testify to that. That machine was operated by Cole and McLaren and I have never personally operated one of those machines under those conditions; that is, when we used them, we did not form snow at the same time the plunger was being operated. In other words, I agree with you as to my own operation of the press, but reserve the fact that I do not know how many ways the press has been operated by others.

Q. Now, referring to the operation of that press illustrated in Plaintiffs' Exhibit 8, the solidification of the  $\text{CO}_2$  in the snow chamber 50 is not affected or modified by the operation of the pressure or compressing means in the pressure chamber 60, is it?

A. I would say it very definitely is. [340]

Q. Will you explain to the court how the operation of the plunger in the compressing chamber 60 affects or modifies the formation of the solid  $\text{CO}_2$  in the chamber 50?

Mr. L. S. Lyon: For the purpose of the record, I would like to have it appear whether the question refers to the form of a chamber shown in Exhibit 8 or to the form which they have been talking about in Exhibit 5 of the patent.

Mr. Foster: My question—I thought it was quite clear, Mr. Lyon, but I am glad to clarify it if it is not—is directed to this plaintiffs' Exhibit 8.

A. That is Fig. 2, the press of Fig. 2 of the Cole and McLaren patent.

(Testimony of Charles L. Jones)

Q. The figure shown here is Fig. 1 on Plaintiffs' Exhibit 8.

A. The press, I think, is shown in more detail on Fig. 2, and is better shown.

Q. I fear that your counsel has not put in an enlargement of that.

A. All right; just let me have Fig. 1. In this form of press the chamber 60 has a different configuration when the plunger is retracted in the position shown in dotted lines as 61 on the print from its configuration when that plunger is advanced, that is, the chamber is 10 inches deeper at that spot, and the mechanical behavior of the chopped particles of snow coming down into that throat is quite different whether they are allowed to drop freely into a [341] 10-inch opening in the press or whether they are allowed to pile up on top of the plunger and the plunger then withdrawn and permitting them to drop into the press as a heap, as a mass.

Q. Possibly my question was not clear, Doctor. It is this: In the apparatus illustrated in Plaintiffs' Exhibit 8, Fig. 1 of Cole and McLaren, the solid CO<sub>2</sub> is formed in the snow chamber 50 entirely independently of the compression of the snow in the compressing chamber 60, isn't it?

A. It is independent in the sense that they are two separate operations performed in the same closed apparatus; yes.

Q. And the compression of the snow in the compression chamber 60 does not modify or affect the solidification of the snow in the chamber 50?

A. I have answered that. It does not affect the actual solidification, but it does affect the character of the charge of solid which is available for pressing the block.

(Testimony of Charles L. Jones)

Mr. Foster: May I borrow from plaintiffs' counsel this book of Mr. Jones' for a moment? I wanted to refer you quite briefly to page 206. May I hand it to the witness, if the court please?

The Witness: Surely. Thank you.

Q. By Mr. Foster: I have asked the witness to refer to his book which he referred to on direct examination, bearing the date 1936, entitled "Carbon Dioxide," and to page 206, where I [342] wish to read a very short statement, near the top of the page, if you please, Doctor.

"The process of producing solid carbon dioxide merely consists of the removal of sufficient heat from the gaseous and liquid forms to reduce the product to a solid state. This may be accomplished by proceeding along any of the lines used for the solidification of other materials, if the availability of the necessary apparatus be presumed.

"The general type methods may be classified as follows:"

And there follows an outline of a page and more, the second subdivision of which is:

"II. By self-evaporative cooling, in which the solidification of a portion of the carbon dioxide is effected by the vaporization of the remainder.

"A. Through evaporation of a bath of liquefied carbon dioxide withdrawing evolved vapor only from above.

"1. By very slow evaporation, adherent and fairly dense products may be made without subsequent pressing.

"2. In the more common practice, the boiling is conducted more rapidly to produce a porous mass of crystals which are subsequently pressed.

"B. By expansion of liquefied carbon dioxide directly to pressures below or at its triple point to produce 'snow', which is subsequently pressed or tamped to produce commercial blocks.

(Testimony of Charles L. Jones)

"1. By formation of snow in one apparatus and its [343] removal, redistribution, and pressing in a second apparatus.

"2. In self-contained presses in which deposition and pressing take place in the same chamber."

That statement of your book is as true today as in 1936, isn't it, Doctor? A. I believe so.

Q. On your direct examination, Doctor, you referred in a commercial production of CO<sub>2</sub> snow to the presence of water snow as an impurity; that is invariably present, isn't it, Doctor, in the commercial product? A. No.

Q. In products made with the Cole and McLaren apparatus, commercial products, do they contain any water snow? A. They may or they may not.

Q. This water snow which you say may be formed in the Cole and McLaren apparatus is formed as the result of the reduction in pressure upon the gas containing water, is that correct? A. No.

Q. What is the reason for precipitation of water snow in the Cole and McLaren apparatus?

A. The reduction in temperature rather than in pressure, as we have already pointed out. The pressure would have to be about four millimeters in order to freeze the water by a reduction of its own pressure.

The Court: Or approximately, in part, by the moisture [344] being in the influent?

A. Entirely. I supposed that was the question, that is, with the moisture in the influent is what caused it to freeze in the press.

Mr. Foster: That was the intention of my question.

A. I answered by its lowering of temperature.

The Court: I was not sure that the record was clear that that was what was meant.



(Testimony of Charles L. Jones)

Mr. Foster: Thank you, your Honor.

Q. This formation of water snow that you say takes place in the snow chamber of the Cole and McLaren apparatus occurs just as it does in nature, doesn't it, that is, there is a reduction in temperature which causes the formation of water snow from the water vapor just as it occurs in nature in the mountains here or in the eastern part of the United States?

A. I am afraid that gets us into a waste of time. It would be very lengthy and involved to answer that. In nature we have some five or six definitely recognized different forms of snow and ice. We have hail, we have sleet, we have slush, we have frothy ice, we have—

Q. Let me try to simplify your task with another question, then, Doctor.

A. Unless you specify some form of snow,—

Q. Isn't it true that water snow is formed by nature sometimes merely by a reduction in temperature upon water vapor, just as it is in the snow chamber of the Cole and [345] McLaren apparatus?

A. No. I am saying "No" for a reason. Snow is formed in nature only when water vapor is cooled as the diluent with air. If you take a vessel, flask, filled with water vapor, and nothing but water vapor, and reduce its temperature, you do not get snow; you get the ice on the walls of the vessel. And, in the same way, the water in this case is diluted. not with air, but with liquid carbon dioxide. and its properties and its fineness and its distribution will vary according to the history of the particular block of carbon dioxide.

Q. I think this question will clarify it. In the snow chamber of the Cole and McLaren, when water is formed



(Testimony of Charles L. Jones)

it is formed because there is a reduction in pressure upon the water vapor contained in the liquid CO<sub>2</sub> as a diluent, just as snow is formed in nature by a reduction in the temperature of the water vapor contained in the air?

The Court: Now, read that question, please.

(Question read by the reporter.)

A. No. Without burdening the record, didn't you mean "temperature" instead of "pressure"?

Mr. Foster: Yes; I did.

A. Reduction in temperature?

Q. Reduction in temperature.

A. Where the question says "reduction of the pressure"?

The Court: That is why I had him read it. [346]

Mr. Foster: With that correction, would you answer?

A. With that correction, I would say "Yes."

Q. And then, as I understand the compressing operation of this CO<sub>2</sub> snow containing some water snow, the snow is compressed under conditions that permit the escape of gas therefrom in the Cole and McLaren apparatus?

A. That is true.

Q. Would it be possible to compress the CO<sub>2</sub> and water snow produced in the Cole and McLaren apparatus without permitting the escape of gas from it, to produce a practical commercial product?

A. I can't answer that. I never tried it.

Q. Well, don't you know, Doctor, as the result of your studies and your experience of squeezing a snowball of water snow when you were a boy, in your hands, and the air coming out through your fingers, that as a practical matter it would be impossible to compress this mass of CO<sub>2</sub> and water snow produced in the Cole and McLaren

(Testimony of Charles L. Jones)

apparatus unless you permitted the gas to escape from it during the compression? A. Not at all.

Q. To produce a product that would be stable?

A. Not at all. I can't follow you.

Q. The analogy seems to you far-fetched?

A. The analogy is not accurate at all, because in the one case you have air entrapped in the pores of the snow-ball which has to be expelled or it will prevent the particles of [347] water snow from touching. In the other case you have, at least in the Cole and McLaren press, comparatively pure carbon dioxide in the pores of your block, and on application of pressure that carbon dioxide will condense and solidify.

Q. All of it contained entrapped in this solid?

A. All of the entrapped gas may be condensed and solidified in the block without in any way preventing the formation of the block. You then face the difficulty that you have internal pressure in the block which may and will explode that block if it is suddenly released from that pressure. It does not follow at all that it can't be done. In fact, I have pressed material in the Cole and McLaren press which had such entrapped gases, and by holding it for a sufficient period of time for the temperature to equalize throughout the block, for the center of the block to become cooled to the same temperature as the outside of the block, the block no longer explodes. Now, you see where this is not a commercial question. In ordinary commercial practice, yes; it is desirable to permit the escape of gases from the block and to accomplish that as quickly as possible.

Q. Not only desirable, but necessary, isn't it, Doctor, for commercial operation? A. I presume so.

(Testimony of Charles L. Jones)

Mr. Foster: I have had a conference with my colleague, Mr. Miketta, and have attempted to limit my cross-examination so that, although we represent different defendants here, we [348] would not duplicate and unnecessarily consume the time of the court. And this, I think, is all at present.

Mr. L. S. Lyon: I assume maybe we had better have the record show that the testimony of this witness on cross-examination would apply to all the defendants, irrespective of which counsel asked the questions.

Mr. Foster: I would like the record to so show, your Honor.

The Court: It may so show. I would like to have you, in so far as possible, avoid duplication. I recognize as a fact that in cases of this kind sometimes it is not possible; that every now and then a question will slip in or an answer will slip in that is duplication. But try, all of you, in your cross-examinations to avoid any more duplication than is necessary.

Mr. Miketta: Yes, your Honor. We have attempted to plan our examination with that in mind.

#### Cross-Examination.

Q. By Mr. Miketta: Dr. Jones, will you please refer to Plaintiffs' Exhibits 5 and 6?

The Court: 6 is a sheet, isn't it? Here it is.

Mr. Miketta: May I hand this to the witness, your Honor?

The Witness: Thank you, yes.

Q. Am I to understand that the picture, Exhibit 5, was taken at the Maspeth plant? A. Yes. [349]

Q. And the plant was owned by Liquid Carbonic Corporation, was it not? A. Yes.

(Testimony of Charles L. Jones)

Q. And the manufacture of dry ice was carried out in this plant by Pressed Air Corporation?

A. I believe so. At the time I saw them, I believe the name of the company was called "The Dry Ice Corporation of America."

Q. Dry Ice Corporation of America. Do you recall, Dr. Jones, that the snow tank was used at Maspeth during 1925 and 1926?

A. I can't answer that. I didn't see it in either year.

Q. You did not see it.

A. I was not familiar with the operation at all.

Q. Just for your own information, I am informed that in October or November of 1926 the snow tanks and production equipment were moved from Maspeth to quarters located in the General Carbonic Company's plant at Sixth Street and East River in Long Island. Do you recall that move?

A. I heard that such a move was made and the same equipment was, at a later date, returned to its original location in Maspeth, Long Island.

Q. Do you recall who took that photograph, Plaintiffs' Exhibit 5?

A. I could not recall that, because I don't know who did take that photograph. That photograph came into my possession [350] subsequent to seeing the equipment, and I am not certain of the date. It could have been taken either before the equipment was moved to the General Carbonic Company's plant, or it could have been taken after it was returned to the General Carbonic Company's, after it was returned from the General plant to the Liquid plant.

(Testimony of Charles L. Jones)

Q. Yes.

A. I would not be positive. I am a little suspicious that the photograph may have an error in that regard. It may have been taken at an earlier time, because it shows apparently a toggle press with a collection of the cylindrical molds, which I have never seen operate and have no knowledge of the operation. It is entirely possible that the photograph may have been taken at a somewhat earlier time.

Mr. Miketta: I had not examined the original, Dr. Jones, but I understand there was a notation on the back. May I see the original?

Mr. Morris: Yes, sir.

Q. By Mr. Miketta: Do you recall whether that notation was in your own handwriting?

A. It was, but it was made at a much later date.

Q. A much later date.

A. So that it would not imply that the photograph was taken on a definite date.

Q. I wanted to refresh your recollection regarding that move to the General Carbonic Company's plant and—  
[351]

A. This photograph may have been taken prior to the time when I saw the snow tanks and show some differences in the detail.

Q. Can you check me on this, Dr. Jones: That Dry Ice Corporation operated at this Sixth Street and East River plant until the fall of 1927, and at that time the snow equipment was moved to Yonkers plant of Syrup Products Company?

A. No; I cannot. Some of the equipment was moved to the Yonkers plant and production was resumed at the Maspeth plant of the Liquid Company.



(Testimony of Charles L. Jones)

Q. By whom?

A. Both by the Dry Ice Corporation of America—that is, after operating in the General Carbonic Company plant, I believe that the Dry Ice Company operated both in Yonkers and also at Maspeth, and some equipment from Long Island City went to both points; just what equipment, I could not testify. I believe that Mr. J. W. Martin, who was chief engineer of the company at the time, would have a much more accurate and correct detailed knowledge of that than I.

Mr. Miketta: May the record show that the original of Plaintiffs' Exhibit 5 is marked "Return to C. L. Jones, Maspeth, 1927"? That, you stated, was in your own handwriting, Doctor?

A. That is correct.

Mr. L. S. Lyon: May the record show, your Honor, that [352] Mr. Martin is the witness referred to who is here in the courtroom?

Mr. Miketta: That is correct, your Honor.

The Witness: May I say in respect to this photograph, that I had no connection with the operation of any of these plants until the late fall of 1928, and testimony prior to that time on my part is merely that of a bystander.

Q. In referring to Exhibit 6, which is the schematic diagram of the snow tank operation, was the liquid CO<sub>2</sub> inlet provided with a valve?

A. It was.

Q. And the CO<sub>2</sub> gas outlet was also provided with a valve?

A. It was.

Q. And both the inlet valves and the outlet valves were operated to admit and shut off the supply of liquid CO<sub>2</sub> into the chamber?

A. Correct.

Q. Were those valves operated in the same manner that the valves to which you have referred in connection with Exhibit 7 were?

A. No; they were not.

(Testimony of Charles L. Jones)

Q. In what way was the operation different, sir?

A. The liquid carbon dioxide inlet valve was closed when the platform balance showed the accumulation of a desired weight of solid.

Q. In other words, when you accumulated a desired mass of [353] solid carbon dioxide in the snow tank, then the inlet valve was shut off, is that correct?

A. That is correct.

Q. And the outlet valve was kept open throughout that period of time?

A. That is correct.

Q. And when was that shut off?

A. That was closed off after the carbon dioxide inlet valve had been closed and at approximately the same time that the manhole itself was opened.

Q. You are referring there to Exhibit 6, is that correct?

A. That is correct.

Q. Do you mind placing on Exhibit 6 in your own handwriting, or making a little diagram indicating the location of the inlet valve, Dr. Jones?

A. These inlet valves were variously placed. When I first came into the picture I had a Lunkenheimer valve placed at some little distance from the tank itself so that union could be more easily broken; and I would indicate that diagrammatically in this fashion (diagramming on exhibit). I even happen to remember the number of the valve.

Mr. Miketta: Let the record show that the witness has plotted a pencil line running from the lefthand end of the device labeled "Liquid CO<sub>2</sub> inlet," running to a union and then continuing downwardly to a level beneath the bench and then toward the right to near the margin of Exhibit 6, at [354] which point the witness has indi-

(Testimony of Charles L. Jones)

cated a valve by a cross and the words "Lurkenheimer No. 721-1/2-inch-inlet valve."

Now, Dr. Jones, will you please indicate where the valve was located that was associated with the CO<sub>2</sub> outlet?

A. I have added a schematic representation of a line leaving the opening marked "CO<sub>2</sub> out," extending upward and to the right I have indicated a valve by a cross in the margin, accompanied by the words "2-inch outlet."

Q. Thank you, sir. In your testimony you have referred to the Martin patent as having shown the location of your CO<sub>2</sub> outlet, is that correct? And I would like to have you—

A. I do not believe that I did so testify. I testified that this portion of the drawing was taken from the patent drawing of the Martin patent.

Q. That is correct. And when you referred to the Marin patent you referred to patent No. 1,659,434, is that correct? A. That is correct.

Q. I call your attention specifically to Fig. 2 of that patent and ask you to compare Plaintiffs' Exhibit 6 with Fig. 3 of this Martin patent. Is it not true, Dr. Jones, that the Martin patent shows the snow tank divided with a reinforced top, the reinforcing being indicated by a channel iron? A. Yes; that is correct.

Q. And the CO<sub>2</sub> outlet is indicated by the numeral 11 in Fig. 3, is it not? [355] A. Yes, it is.

Q. In speaking of Exhibit 6, you referred to a filter cloth? A. Yes.

Q. Is it not a fact, Dr. Jones, that the patent describes this so-called filter cloth as consisting of canvas reinforced with galvanized iron mesh on both sides, and in

(Testimony of Charles L. Jones)

that connection I specifically call your attention to page 3 of the patent, lines 33 to 37, where it is stated:

"As shown more clearly in Fig. 4, the screen consists essentially of a canvas layer, 55, clamped between a lower wire net, 56, and an upper wire net 57, each of which may be made out of four-mesh galvanized iron wire."

A. That is correct.

Q. Without causing you the inconvenience of changing Exhibit 6, we can assume that Exhibit 6 is supposed to represent the Martin snow tank as shown in the patent; is that correct?

A. I have Exhibit 6. That is a correctly described schematic representation of this patent drawing. It does not depict it in every particular. Martin also shows a reinforcing member around the lower portion of his inner tank. However, the essential features of the snow tank were intended to represent the same operation.

Mr. Miketta: I would like to introduce, may it please the court, Martin Patent No. 1,659,434, as Defendant's [356] Exhibit B.

The Court: It may be received and so marked.

[Note: Defendants' Exhibit B will be found in the Book of Exhibits at pages 1359 and 1500.]

Q. By Mr. Miketta: To what extent was this inner chamber of the Martin snow tank filled with snow at the end of a run, Dr. Jones?

A. The practice varied somewhat in that particular, and sometimes, and I am testifying from memory, the common size snow tank was filled with about 400 pounds of snow. However, we customarily filled them, at the

(Testimony of Charles L. Jones)

Elizabeth plant, during my time there, to only 300 pounds of snow, but it would not be packed so tightly. [357]

\* \* \* \* \*

The Court: Very well. Then the exhibit will not be placed in evidence, but will be merely marked for identification for the purpose of explaining this witness' testimony on direct and on cross.

Q. By Mr. Miketta: Dr. Jones, I believe you have indicated, in not all instances, but in many instances, that the snow tank was almost full of snow at the end of the run.

A. That is correct.

Q. And the snow was, therefore, piled in this snow tank to a height well above the door shown in Plaintiffs' Exhibit 6?

A. Yes.

Q. Did you notice the operators using a sharp-pointed spade in cutting around the door, after the door was removed, in order to extract from the snow tank a chunk or block of [359] snow?

A. Yes.

Q. When you referred to snow, on direct, as being fine, powdery, or chalky, you did not mean that the snow was loose like sand or dry flour?

A. On the contrary, in the snow tank the degree of packing of that fine, floury material depends entirely on the gross weight packed into the tank. That is the reason why we later found it desirable not to load the snow tank so heavily, so it could be more easily shoveled out. If the liquid valve be turned on for, say, only 30 seconds, allowing possibly 20 or 30 pounds of snow to enter the tank, and then the door opened, the material in there is so light and fluffy that it can easily be blown out with a compressed air hose, and it would not then be necessary to



(Testimony of Charles L. Jones)

use any implement on it; but it can be packed to a greater or less degree. It can be packed until it is quite hard.

The Court: The form of it would also depend, would it not, on the amount of moisture in the intake?

A. Yes.

Q. By Mr. Miketta: Is it not a fact that the liquid carbon dioxide used in the manufacture of snow is the same, as far as purity is concerned, as the liquid carbon dioxide that is used for carbonating beverages ordinarily, as of 1926 and 1927?

A. No. That question has a very involved answer.  
[360]

Q. Maybe I can simplify it, and ask you, for example, considering the Maspeth plant that was owned by the Liquid Carbonic Corporation, they manufactured liquid carbon dioxide?

A. That is correct.

Q. That liquid carbon dioxide was being sold for carbonated beverages?

A. Correct.

Q. The same liquid carbon dioxide was also being used for making snow in the snow tank?

A. As to the Maspeth plant, that is correct.

Q. And your answer would be the same as concerns the General Carbonic Company's plant at Sixth Street and East River?

A. That is correct.

Q. Subsequently, in later years, when the plants were devoted solely to the production, let us say, of snow or block ice, then perhaps the degree of perfection of the liquid was not carried to as great an extent; is that correct?

A. It is correct, but misleading. It was not a question of degree of perfection; it was a question of a dif-

(Testimony of Charles L. Jones)

ferent source. That is, the impurities present in the source make a different solution of carbon dioxide, as different as petroleum from different fields, and what constitutes adequate perfection for beverage purposes in [361] one type or process has no relation to some other type of process.

Q. Aren't we simply talking about a content of impurities, of moistures or hydrogen sulphide, which perhaps does not amount to more than one-half of one per cent of the weight of the liquid?

A. No, I would say that impurities are to be viewed in the light of their industrial importance, and the losses they can cause, rather than percentages.

Q. So far as percentages are concerned; is that correct?      A. What is your statement?

Q. That these various impurities at no time amounted to more than about four-tenths or five-tenths by weight of the liquid CO<sub>2</sub>—four-tenths of one per cent?

Mr. L. S. Lyon: I would like to know what "at no time" means.

Mr. Miketta: It is confining the question and answer to the period prior to 1928.

A. No, the small impurities remaining in the block would be in all cases below the figure you have given.

The Court: Let me ask you: Carbon dioxide is odorless, colorless and non-irritating?

A. Yes, it is colorless. It has a pungent odor, which is usually considered non-irritating.

Q. There might be certain foreign substances in a [362] product furnished from a well that would have to be extracted before it was fit for human consumption in

(Testimony of Charles L. Jones)

beverages, and those might not be particularly objectionable in the making of dry ice for refrigeration purposes?

A. That is correct.

Q. In other words, you have two different problems. It might be that the same product could be used for both, and it might be that it could not?

A. That is correct. I would say the most serious effect of impurities had nothing to do with the ultimate use of the product, but rather with the effect on the structure of the block, as to its mechanical strength, its freedom from flaws and its ability to stand rough handling and transportation over long distances; and as little as  $2/1000$  of one per cent of certain hydrocarbons is enough to promote the growth of a sandy structure and the disintegration of the mechanical strength of the product. As little as one-tenth of one per cent of water is also sufficient to have a very appreciable effect on the storage and handling characteristics of the finished product.

Q. In other words, the problems are different. You might not have to be as particular with the commercial product as with a product for human consumption?

A. That is correct.

(Short recess.)

Q. By Mr. Miketta: Dr. Jones, do you recall seeing [363] frost on the lines carrying the liquid carbon dioxide into the snow tanks?

A. At what plant? What year?

Q. During the period of time to which you have referred on direct examination, when you were describing the operation of snow tanks in 1927, or thereabouts?

A. At times, yes; at other times, no.

(Testimony of Charles L. Jones)

Q. I call your attention to Plaintiffs' Exhibit 5, and particularly to the white spots appearing immediately underneath the doors leading to the snow tanks, and ask if those are not frosted unions. A. They are.

Q. The temperature of the incoming liquid would have to be 30 degrees, or therebelow in order to cause frost? A. It would.

Q. So that in operating the snow tanks liquid carbon dioxide at temperatures below 60 degrees Fahrenheit were used? A. At times.

Q. Is it not a fact, Dr. Jones, that prior to 1926 it was known that the temperature of the liquid carbon dioxide affected the yield of snow, without regard to the type of equipment?

A. Oh, yes. I have explained that the refrigeration was used to the greatest extent that it was possible, and in accordance with the amount of money that was available [364] to provide such refrigeration, at all times; yes, indeed.

Q. And during those early years, say 1925 or 1926, the Dry Ice Corporation of America really did not have a great deal of money? A. That is correct.

Q. It was known, prior to 1926, that if liquid carbon dioxide was at a lower temperature you obtained a higher yield of snow; is that correct? A. That is right.

Q. It was also known, prior to 1926, that the incoming liquid could be chilled by either flashing off this liquid, or by heat exchange between the incoming liquid and the unsolidified exhaust gases from the chamber?

A. Will you read that back?

(Question read by the reporter.)

A. It was.

(Testimony of Charles L. Jones)

Mr. L. S. Lyon: I would like to object to this line of cross-examination upon the ground that it is not proper cross-examination, and is again an attempt to build up what is called the prior art—what was known and what was not known. I don't think it is proper on plaintiffs' case in chief.

The Court: I think this question is pretty close to borderline, but I will allow it.

Q. By Mr. Miketta: Dr. Jones, you have testified on direct that there was a pressure gauge connected to the [365] snow tank? A. Yes.

Q. Please indicate on Exhibit 6 where that pressure gauge was attached.

The Court: By a mark, do you mean?

Mr. Miketta: Yes.

A. There is no standard practice for that. We customarily placed that up in the top of the tank, however.

Mr. Miketta: Let the record show that the witness has drawn by hand a pressure gauge extending through the top of the snow tank, and communicating with the space between the filter cloth and the cover.

The Court: It may so show.

Q. By Mr. Miketta: On direct examination, Dr. Jones, you stated that the snow tanks were made of quarter-inch metal, or sometimes thinner. Can you state that a snow tank made, such as you have described, and a snow tank such as shown in Martin patent 1,659,434, is capable of withstanding internal pressure on the order, say, of 100 pounds, if it were made out of quarter-inch steel plate?

A. On the contrary, I have no doubt that snow tanks could easily be constructed to withstand any desired internal pressure.



(Testimony of Charles L. Jones)

Q. They were adapted to be operated at pressure above the triple point?

A. The snow tanks were not adapted to be operated at [366] a pressure above the triple point.

Q. They were adapted to withstand pressure above the triple point; is that correct?

A. I think we would have been in trouble with the authorities had we attempted to do so. I would like to make the reservation that the defendants' witness Martin probably knows the early practice better than I do myself. However, snow tanks which were purchased under my supervision were given a hydrostatic test in the manufacturing plant of 75 pounds per square inch. We allowed a factor of safety of 5 to 1 on the desired operating pressure of 15 pounds, and which we felt was adequate; but it would certainly be unsafe, and very definitely illegal, to operate a tank tested to 75 pounds at an operating pressure of 60 to 70 pounds.

Q. Dr. Jones, irrespective of whether or not you had permits to operate equipment at such pressure, is it not a fact that a snow tank, a Martin snow tank, made of one-quarter-inch steel, would be capable of withstanding internal pressure on the order of 100 pounds per square inch?

A. "Capable of withstanding" is ambiguous. I should say yes, they would be capable of withstanding it, but they would be utterly unsafe to operate at such pressure.

Q. May I ask whether 100 pounds is above the triple point of CO<sub>2</sub>? [367]

A. Yes.

Q. On direct examination, Dr. Jones, you stated that the snow tanks gave a recovery of 15 to 30 per cent. In making that statement did you consider the following

(Testimony of Charles L. Jones)

which appears on page 2, lines 7 to 17, of Defendants' Exhibit B for identification or illustration, reading as follows:

"As a result, these various improvements, particularly the feature of snow formation near the bottom of the tank and the slow upward progress of the mixture, toward the screen, through the previously collected quantities of the snow, are very effective in facilitating the recovery of a relatively large percentage of the liquid, in snow form, the yield under good conditions being 40%, or even more."

Do you wish to change your previous answer?

A. No, I do not. What is the exhibit?

Q. That appears on page 2, lines 7 to 17.

A. This statement is a mere statement of the patentee that through the method he uses he gets relatively a large percentage of the liquid in snow form. I should say that regardless of what his invention may have been, or when he made it, the invention would have no effect whatever upon the percentage of solid formed in one pass of liquid delivered to his apparatus, which depends only on temperature of the liquid formed in it. I made the statement that [368] yields were 15 to 30 per cent, being the yields per pass. The statement in the patent is indefinite. It does not say whether it is meant yield per pass or the overall yield. However, a yield of 40 per cent, and I take this from a chart shown on—I don't know whether this is in or out—

Q. You are referring to your book? A. Yes.

Q. On what page of the chart, Dr. Jones?

A. 197. A yield of 40 per cent is attained at a temperature of 40 degrees Fahrenheit. Therefore, I would

(Testimony of Charles L. Jones)

say that the yield claimed in the patent was obtained at certain times through the use of cold liquid formed in the snow tank, but over the entire period it was much more common to encounter *warm* liquid at a temperature of 60 or 70 degrees which, again taken from the chart, would correspond to a yield of about 30 per cent.

Q. Dr. Jones, what was the lowest temperature of liquid carbon dioxide which you ever saw introduced into the Martin snow tank?

A. About 20 degrees Fahrenheit.

Q. On this question of yield per pass, or yield over a longer period, is it not a fact, that if you can recover 40 per cent, let us assume, under one pass, you will have 50 per cent recovery under five passes, and 60 per cent recovery under ten passes? [369]

A. No, it is not a fact.

Q. Would you mind assuming, for example, that you fed in 100 pounds of liquid CO<sub>2</sub> and obtained a 40 per cent yield, or 40 pounds of snow—

A. Yes.

Q. The next time, or next pass, since you are recirculating the unsolidified gas, you only need to add an additional 40 pounds of new carbon dioxide to the 60 which you had previously had; is that correct, and you again obtain 40 per cent?

A. No, it is not clear at all. You do not need to add anything when you return, or you may add 500 pounds. In order to keep the amount of carbon dioxide in the system constant you would add 40 pounds, replenishing the amount taken out as solids. Does that answer the question?

Q. That answers the question, thank you. Referring to the cost of operation of the Martin snow tank, to which

(Testimony of Charles L. Jones)

you have referred on direct examination, do you recall having made a speech before the Compressed Gas Association, in January, 1931, at which time you stated that the price of dry ice in block form, during the years 1926 to 1930, had been markedly uniform, just about \$100 per ton?

A. Yes, I believe that I did make such statement.

Q. At that time, I think you testified, that is, on direct examination, I believe you testified that during that period of time approximately, when snow was being made [370] in the Martin snow tanks, the labor cost of operating the snow tank and making blocks was an average of about \$7.00 per ton.

A. I took the figure of \$7.00 per ton from the series of daily operating sheets at the Elizabeth, New Jersey, plant, in August of 1928. [371]

Q. Well, that is fairly representative of a large plant?

A. It may vary quite widely from that figure for other plants and other times of year.

Q. Am I correct in assuming that the present cost, labor cost of manufacturing block ice, is somewhere around \$2.50 to \$3.00 per ton?

A. No; you are not correct.

Q. What is the figure, please?

A. I cannot give you such a figure.

Q. Well, is it very far from the accurate cost figure, labor cost?

A. I do not believe you have any basis for comparison. The figure for snow tank labor was only the labor for the snow tank room, that is, the actual solidification, and not the total labor costs of the process—

(Testimony of Charles L. Jones)

Q. Oh, I see.

A. —in any way, shape or form.

Q. That is correct; that is correct.

A. And on the same basis, the actual press labor, the labor for operating the press and making the solid blocks, varies at the present time from about 25 cents a ton to as high as \$1.25, I would say, depending on the size plant.

Q. For operating the press and for packaging the ice?

A. For operating the press, sawing into 10-inch blocks, and handling away from the site. That does not include all ice-handling labor, nor neither did the fixed \$7 figure [372] include all ice-handling labor.

Q. What is the average price at which dry ice is now being sold per ton—around \$40?

A. I do not believe I am competent to testify on that. I am willing to say "Yes" to your guess, if you want to advance one.

Q. Does \$40 sound like a reasonable sum for the present price?

A. \$40 sounds like a reasonable sum for the present price.

Q. In your book, on pages 207 to 209, you referred to the Martin snow tank and its operation, and stated there—I read from page 209, Dr. Jones:—"The comparatively simple and crude snow tank method is still in use, and is much misunderstood. While it is ill-adapted for quantity production and involves from 3 per cent to over 10 per cent loss in transferring the snow to open molds for pressing, it was designed for the purpose of exploring a market at minimum capital investment. For that pur-



(Testimony of Charles L. Jones)

pose it has not yet been surpassed in the art." Have I read that correctly?

A. You have read it correctly and I do not have any desire to change the statement.

Q. You were influenced, were you not, Dr. Jones, in making that statement by the fact that a snow tank cost only around \$400, whereas larger presses cost in the neighborhood of \$5,000 to \$7,000? [373]

A. Well, I don't know that your comparison is exactly right. I believe we got both snow tanks and presses at figures considerably lower than the ones you have mentioned.

Q. But there is a wide discrepancy between the capital investments required, is that correct?

A. The snow tank is a much cheaper method for capital investment.

Q. You have testified on direct, I believe, that the loss in handling was appreciably larger than that to which you refer on page 209 of your book. I think you testified that the loss ranged from 7 percent to 15 percent. Do you now wish to change your answer?

A. No; I do not. If you will permit me this form of answer: When the book was written I was endeavoring to avoid any statements which painted the industry in too black colors and I selected a figure somewhat low. I would say that the actual loss varied extremely widely. I was looking at one old record of a snow tank operation starting up in Jacksonville, Florida, where the humidity is high, the temperature is high, and because of the humidity, the molds and the whole apparatus is wringing wet almost as soon as the operation is started, and it showed a loss of 27 percent from the weight in the snow tank to

(Testimony of Charles L. Jones)

the weight of the finished block. So I feel that the figure of 7 to 15 percent, with an average of 10, is not unfair.

If you want to go on adding figures to the record, however, [374] I would say that at Elizabeth plant, where the operation was on a fairly large scale and fairly steady, that I believe the records would show losses of about 6 percent, 5 to 6 percent; and if you were searching for a figure that will present the snow tank in a favorable light, I would offer that figure and agree to it.

Mr. Miketta: May I introduce the pages to which we have referred, 207, 208, and 209, from Dr. Jones' book, as illustrative of his testimony, to be marked Exhibit C?

The Court: They may be marked for identification as Defendants' Exhibit C.

[Note: Defendants' Exhibit C will be found in the Book of Exhibits at page 1360.]

Q. By Mr. Miketta: You have stated, Dr. Jones, that in many instances, at least, the snow collected in the snow tank was well above the door and sometimes completely filled the tank? A. That is correct.

Q. Is it not a fact that the nozzle which is indicated by the numeral 33 in the Martin patent, Defendants' Exhibit B, is near the bottom of the tank? A. It is.

Q. And during operation liquid carbon dioxide would be entrapped within the snow held within the tank?

A. No; that is not correct.

Q. Well, as I visualize it, Dr. Jones—and I would like to have you clarify me—let us assume the tank is as high as the rostrum and we have a pile or mass of snow in it, [375] say, so high, two and one-half feet high, and

(Testimony of Charles L. Jones)

liquid CO<sub>2</sub> is being admitted into the bottom of this mass of snow; would not some of that liquid carbon dioxide be entrapped or retained, perhaps, for a short period of time, but entrained there within that mass by reason of the very low temperature of the snow and the pressure within that tank? A. No.

Q. How do you explain your answer, please, sir?

A. Liquid carbon dioxide has no existence below the triple point pressure; so that in order to entrap any such liquid in the snow there would have to be a pressure greater than 60 pounds per square inch in the mass of snow.

Q. Well, assuming there was— A. Excuse me.

Q. Pardon me.

A. There was a great deal of speculation and a great many words used to express what might be happening inside that opaque, non-transparent tank at the time under discussion, and I have heard a great many theories as to what might be the condition in that mass of snow. Each person connected with it apparently had his own way of expressing what went on. However, in order to believe that there is a liquid entrapped in that snow, when the pressure gauge at the point indicated showed 10 pounds, you would have to believe that there is a pressure drop through that mass of snow from 60 pounds in the lower portion to 10 pounds in the [376] upper portion. I cannot believe that. Perhaps someone else can.

Q. May I point to the exhibit? By referring to Exhibit 6, Dr. Jones, and perhaps to the Martin patent, you have indicated that the pressure gauge is connected to the area above this filter screen, is that correct?

A. That is correct.

(Testimony of Charles L. Jones)

Q. And is it not true that during the operation of the snow tank quantities of carbon dioxide would be held up against the bottom of that filter screen?

A. That is correct.

Q. And the snow itself is retained within this inner chamber, which in turn is inside the outer housing of the snow tank?

A. That is correct.

Q. So that there would be some resistance to the passage of gas from within the snow tank through the accumulated snow and through the filter cloth and screen before it entered the conduit to which the pressure gauge was connected?

A. That is correct.

Q. And under those conditions would a pressure differential exist between that shown by the pressure gauge and that existing within the snow tank?

A. Well, yes. This is a very indefinite pressure existing in the snow tank. I do not believe that I know of any measurements of just what that pressure was. However, [377] there is a pressure differential; yes.

Q. As I understood your testimony on direct, when higher pressures exist in an expansion chamber, the crystals of snow that are formed are larger?

A. That is correct.

Q. And when you have larger crystals you can produce denser and stronger blocks?

A. No.

Q. I perhaps misunderstood your testimony. What is the fact?

A. With larger crystals it is more easy to produce a dense block. However, the question of strength gets back into the question of how much water is present, how is it divided. The strongest products are the snow-ice products with the greater amount of impurities and pressed in cer-

(Testimony of Charles L. Jones)

tain ways. We are getting into an involved field there. In general, the coarser the crystal size, the easier the material is handled. Therefore, if you will accept that answer, the coarse crystal size is desirable and the higher pressure makes, of course, a crystal from the standpoint of easy operation.

Q. Very well. I apparently misunderstood your testimony, Dr. Jones. There was no attempt on my part to change it in any way, but it is a little difficult to follow at times. - I call your attention to Defendants' Exhibit B—that is the Martin patent—and particularly to the statement [378] appearing on page 3, starting at line 60; will you follow me on that, please? A. All right.

Q. The patent there speaks of the minimum pressure existing in the process and then states: "This minimum of expansion pressure will fluctuate, according to the resistance imposed by the increasing amounts of superposed snow and particularly by the thickness and density of the layer of snow that collects on the lower surface of the screen and, as before very fully explained, the internal pressure will rise in response to clogging of the outlet up to the full limit of the 1,000 pounds or more pressure of the source." Have I read that correctly? A. Yes.

Q. With that thought in mind which has just been read, was not the Martin snow tank adapted to operate so as to produce large crystals and triple point ice?

A. Oh, definitely not. Continuing—

Q. Assuming that the tanks were strong enough?

A. Would you care to continue reading the patent at the point where you left off?



(Testimony of Charles L. Jones)

Q. Is that going to be your answer?

A. I suspect so. I think that, in the first place, the statement as to 1,000 pounds says that that pressure will be produced in response to the clogging of the outlet.

Q. That is right. [379]

A. And I believe counsel has asked me whether there ever was a practical method of making CO<sub>2</sub> that had no outlet and compelled me to answer "No"; that you had to have an outlet or you could not make the stuff.

Q. Are you disregarding, Dr. Jones, that statement where it states that the pressure will fluctuate, according to the resistance imposed by the increasing amounts of superposed snow; is that correct?

A. We have covered that. I have stated that I am unable to believe that when the pressure gauge shows a pressure of less than 15 pounds, that the pressure in the body of the snow could be at the triple point pressure or higher. I have never seen evidence that would prove that such pressures existed in operation.

Q. Have you ever examined the snow made in the Martin snow tank and seen large crystals?

A. No. Define that "large," please.

Q. You can make your own definitions, Dr. Jones. You are the expert here. You have referred to large crystals, or crystals of large size, and I would like to know—

A. Perhaps, to clarify what you are getting at, I have observed variation in the crystal size in the Martin snow tank with pressure. We have also changed the operating pressure in the snow tank and operated it at 30 pounds pressure. I feel, at 30 pounds, we got a coarser crystal and a better type of snow than we got at 10 to 15 pounds.

[380]

(Testimony of Charles L. Jones)

Q. And the pressure gauge was connected to the outside channels and not to the interior of the snow tank?

A. That is correct.

Q. I call your attention—

A. I have never, however, either had any evidence that the triple point was reached, nor have we ever removed from the snow tank material such as is obtained at the triple point, nor do I believe we could remove such a product with the tools at our disposal.

Q. Why would that be so?

A. Because as soon as the mass of crystals in the chamber becomes wet by liquid CO<sub>2</sub> it has the same cementing effect to which counsel referred, I think, in last Wednesday as in the making of a snow fort, when snow is placed in a box and water is poured over it and frozen in order to harden the block, and the wetting of the snow in the chamber has precisely the same effect; it can be dug out of the box but it is obviously harder to dig out than the loose snow.

Q. It would be much more difficult, I grant you that.

A. Yes.

Q. I now call your attention to page 4 of the Martin patent, Defendants' Exhibit B, particularly to the matter appearing in lines 8 to 13, where it is stated: "Furthermore, after the tank is partly filled with snow, the upflow of the gas, against gravity, and in contact with pre-formed crystals of snow, promotes formation of the maximum amount of crystals [381] of maximum size."

A. That is a misstatement.

Q. That is a correct statement, is it not?

A. It is not. It is a misstatement. The fallacy in the statement lies in the fact that a crystal once formed can

(Testimony of Charles L. Jones)

only grow by having some medium around it to supply material for its growth and some method of cooling which will cause it to solidify. So that crystals, so placed, will grow very readily when surrounded by a bath of evaporating liquid. They can only grow when surrounded by an atmosphere of carbon dioxide gas if they have inherent refrigeration to cause that gas to condense, otherwise cold carbon dioxide can pass through them forever without increase in size.

In the same way, a snowstorm gives fine snowflakes, and those snowflakes only grow when the snow is descending through an atmosphere which has enough water vapor present under conditions that will condense that water vapor and cause the crystal to grow. Merely dropping through a great distance in dry air will not build the size of a snow crystal at all.

Q. But in this case, the crystals within the body of the snow tank were surrounded with an atmosphere of carbon dioxide gas and carbon dioxide vapor, were they not?

A. They were.

Q. And under such conditions do not crystals grow in size as they would in a saturated or supersaturated solution? [382] And in that connection, before you answer, Dr. Jones, I call your attention to page 80 or your book.

A. It is not necessary. Those crystals grow in two ways. They grow on storage—

Q. May I have a brief answer to my question, please?

A. I will try to.

The Court: Let us put it off until 2:00 o'clock.

The Witness: All right.

(Whereupon a recess was taken until 2:00 o'clock p. m. of the same day.) [383]

AFTERNOON SESSION.

2:00 o'Clock.

The Court: You may proceed.

CHARLES L. JONES,

recalled.

Cross-Examination,

resumed.

Mr. Miketta: Mr. Reporter, I believe there was a question on the record. Do you mind reading the preceding question and the last one?

(Record read by the reporter as requested.)

A. The two ways in which crystals grow are best illustrated by the case of a salt solution. In such a case crystals will grow on any change of temperature or saturation in which the total weight of crystals is increasing at the expense of the material in solution, and in this way crystals can grow quite rapidly. But if the—

The Court: Now, wait a minute. Let me be sure I got that. Would you read it, please?

(Answer read by the reporter.)

Q. By the Court: Change in temperature or change in saturation? A. Yes.

The Court All right; go ahead.

A. But if, without change of temperature or saturation, a saturated salt solution containing crystals is allowed to [384] stand, the crystals will again grow, but the gross weight of salt in the solution will remain the same and growth takes place by the disappearance of the smaller crystals and the growth of the large ones.

(Testimony of Charles L. Jones)

Q. By the Court: Combinations.

A. It is a transfer of material from the small to the large crystal, without the growth from an outside source at all.

Q. The individual crystal will grow but the total will not grow?

A. Will not change. In the case of the snow tank we get only the second type of crystal growth, and it is possible to close the snow tank with its charge and allow it to stand over a period of time, let us say, 24 hours or longer, and get an appreciable growth of crystal size, starting with, say, 300 pounds of snow, and neglecting normal heat absorbed from the atmosphere, ending with 300 pounds of snow. We do not get the first type of crystal growth in which the individual crystal is growing from the carbon dioxide being supplied to it during the forming period. This type is obtained, so far as I am aware, only in the triple point type of operation where a bath of liquid carbon dioxide is available to supply both the material and the refrigeration necessary to add material to the individual crystal.

Q. By Mr. Miketta: You do have a change in temperature, that is, a reduction in temperature from the temperature at [385] which the liquid CO<sub>2</sub> is introduced to a temperature, I believe, of about 109 degrees, minus 109, which is the temperature of the snow, do you not?

A. Yes; we do.

Q. Will you please again refer to Plaintiff's Exhibit 6, which is the diagram of the snow tank? A. Yes.

Q. As I understand your testimony, after the mold was tamped and filled with snow, a loose top plate was placed on top of that snow, is that correct?

A. That is correct.



(Testimony of Charles L. Jones)

Q. Is the inclined member of the central figure of that exhibit an edge view of that plate? A. It is.

Q. During pressing after that mold and its top plate were taken over to the press which is shown on the left-hand side, during pressing did relative motion occur between the top plate and the mold? A. It did.

Q. And was there any relative motion between the press or plunger which is the bottom member and the sides of the mold? A. There was.

Q. In effect that constitutes double pressing, does it not, double and bottom pressing? A. Yes.

The Court: Top and bottom pressing? [386]

A. Top and bottom pressing.

Mr. Miketta: Top and bottom pressing; that is right.

Q. And it is also a fact that it was known for a long time, since 1920, that pressing from both top and bottom increases the density because it reduces the heat-to-diameter ratio of the mold? A. That is correct.

Q. Does the patent in suit, the Cole and McLaren patent, describe bottom pressing?

A. No; I do not think it does.

Q. I believe you have stated that the photograph of Plaintiffs' Exhibit 5 shows in the foreground and to the left a toggle type press, is that correct? A. Yes.

Q. And I don't remember whether you stated whether you saw this in operation or not.

A. I stated that I had not seen it in operation and had no knowledge of its operation. It was prior to my connection.

Q. I won't ask you any questions about it, then, sir. When you visited the Maspeth plant did you at any time on

(Testimony of Charles L. Jones)

the occasion of such visit observe a press which is diagrammatically shown on the drawing which I hand you?

A. No; I didn't see any such press.

Q. You did not see one similar to that?

A. Neither at that time nor before nor after.

Q. Do you remember seeing any press at the Maspeth plant? [387]

A. Only an open vertical stock hydraulic press, I believe made by Watson-Stillman, and shown in the photograph, Exhibit—what is it, 5?

Q. 5.

A. —and indicated thereon in ink "W. S. Press," which is an open press of the type illustrated diagrammatically in Exhibit 6.

Q. Dr. Jones, did you see a press of the type shown on that drawing which I have just handed you in the yard or just outside the windows at the Maspeth plant?

A. No; I did not. At the time I was taken to the Maspeth plant I possibly did not belong to the select circle that might have seen everything that was available to be seen; and I saw only the installation that was then actually in use.

Q. Do you recall seeing such a press at the plant of the General Carbonic Products Company, Inc. in 1928?

A. I did not see any presses in the General Carbonic plant in 1927 and, in fact, was not in the General plant between about 1925 and the fall of 1928.

Mr. Miketta: I would like to introduce that drawing.

The Court: It may be marked Defendants' for identification next in order.

The Clerk: D.

[Note: Defendants' Exhibit D will be found in the Book of Exhibits at page 1363.]

(Testimony of Charles L. Jones)

Q. By Mr. Miketta: In 1927, Dr. Jones, you were particularly interested in developing sales for dry ice, were you not?

A. In 1927 I was employed as a consultant by the Dry Ice [388] Corporation, and I dealt with just such questions as they chose to ask me.

Q. Did you have anything to do with sales work, or the promotion of uses for dry ice?

A. Very little. They invited me to submit suggestions along any line pertaining to their business, with the utmost freedom, but those suggestions were usually submitted in the form of a letter, and I did not always hear what happened to them after they left my hands.

Q. Dry ice had been made for many years prior to 1926, had it not?

A. No, Dry Ice was a registered trademark, which was originated by the Dry Ice people, so far as I know, and was only manufactured from 1925, or possibly late '24.

Q. May I change my question? I was using dry ice generically, and not as a trade name. Is it not a fact that solidified carbon dioxide, in block form, had been manufactured and described in the literature as having been manufactured and used for many years prior to 1926?

A. I am not aware of any commercial—

Mr. L. S. Lyon: Just a minute. I object to that as not a proper method of proof, as to what had been described in literature; it is not a proper question on cross-examination.

The Court: Will you read the question?

(Question read by the reporter.)

The Court: Objection overruled. [389]

(Testimony of Charles L. Jones)

A. No, it is not a fact. The first commercial sale of which I had ever heard was in the fall of 1924. I have no way of knowing whether that was absolutely the first in history, but certainly it was the first I had any knowledge of.

Q. Will you please refer to your book, Dr. Jones, at page 193? I will read the beginning of that statement.

“Although carbon dioxide in the solid form has been applied to laboratory problems to some extent during the past century its industrial application for refrigeration extends back only a comparatively few years. Perhaps the first suggestion that solidified carbon dioxide might find application in commercial refrigeration is found in the patent specification of Tichborne and Elworthy. About the year 1907 Newth made this most interesting comment concerning the solid carbon dioxide industry in England: ‘Carbonic acid snow’ as this substance is sometimes termed, is now an article of commerce, the compound being sent into the market in this form to avoid the cost of the carriage of the necessarily heavy steel bottles containing the liquid.” [390]

A. That is Newth’s statement. I have never seen any evidence, beyond Newth’s statement, of a commercial sale, nor do I wish to change my previous statement. I see nothing conflicting between the statement in the book and the statement I have made. The first commercial sale of a block of solid carbon dioxide of which I have any knowledge was in 1924, in the United States. The patent to Tichborne, which is mentioned there, does not recite the making of blocks, but does recite the making of the solid form, in order to store the material without using steel

(Testimony of Charles L. Jones)

bottles, but apparently only contemplated making the snow, and holding it in a box, and reliquefying it.

Q. Does he then refer to the Elworthy patent, No. 7436?

A. Again the book speaks for itself, but I believe the statement is made that the first suggestion that it might find application in commercial refrigeration—that's the way it is stated—so far as I know, that is as far as Elworthy went, to make the suggestion that it might find application.

Q. When you wrote your book you knew that the Elworthy patent stated this:

"The compressing apparatus is indicated in Figure 1, m being a receptacle, below the chamber m, into which the carbonic acid snow passes, and is very forcibly compressed in the receptacle by means of a pressure ram actuated by [391] a hydraulic cylinder n, valves of the usual kind being provided by which water under pressure can be admitted into the cylinder n. When the snow has thus been compressed, the ram is withdrawn and the block of carbonic acid ice removed."

I ask you if that has been correctly read, showing you a copy of British patent 7436, 1895, to Elworthy.

Mr. L. S. Lyon: I object to that as not a proper method of proof, and not proper cross-examination.

The Court: I think that is true.

Mr. Miketta: This gentleman has been making some rather general statements as to what has been done in the past, and has referred to his book. His book contains certain statements which I believe are contrary to the impression which he is attempting to leave with your Honor. I think we have a right to point out some of the inconsistencies in this witness' testimony.



(Testimony of Charles L. Jones)

The Witness: May I ask I said only my first knowledge of any commercial sale.

The Court: Maybe I don't understand. I don't see the inconsistency, and it does not seem to me that what is in that patent is material except possibly to cast some doubt about the accuracy of the statement in the book; but we are not trying that issue here. If you broaden it out we would not know just where we would come out. I think this laps over into the affirmative proof. If that [392] is the case, in so far as the prior art has application to the case, it should be done by your own witnesses rather than by this method. There is no fixed line, of course. I just have to use my best judgment as to where to stop.

Mr. Miketta: May I drop the subject, but before I drop it, may I have page 193 of this book, from which I read, introduced for identification, as well as the British patent?

The Court: They may be marked next in order.

The Clerk: The page will be E, and the patent F.

[Note: Defendants' Exhibit E will be found in the Book of Exhibits at page 1364.]

[Note: Defendants' Exhibit F will be found in the Book of Exhibits at page 1365 and 1538.]

The Court: Tell me this: Isn't the term "dry ice" now almost used like the term "aluminum"?

A. I believe so.

The Court: It is a trade name, but you refer to a certain product as dry ice, just as you refer to aluminum?

A. Yes, we always refer to it more like tabasco sauce. That is the name of a pepper, but it was introduced by some particular sauce maker.

(Testimony of Charles L. Jones)

Q. By Mr. Miketta: Dr. Jones, in the liquid carbon dioxide industry would you call a vessel, such as a tank or cylinder, an enclosed or sealed vessel, if it had a pin-hole opening in it?

A. A vessel for what purpose? I surely would call it a sealed vessel for some purposes, and not for others. I have, for example, at my home a teakettle which has a little whistle on the top of it, and it even has a plastic [393] canary for the purpose of warning me when the kettle boils. I call that a sealed vessel for the purpose of boiling water; certainly a sealed vessel for the purpose of blowing the whistle; but it has an opening in it. [394]

\* \* \* \* \*

Q. By Mr. Miketta: Dr. Jones, by whom was Exhibit 7 and the various sheets forming a part thereof prepared? A. I prepared that myself.

Q. When did you prepare them?

A. The past week.

Q. Had you seen defendants' diagrams C, D, E, and F, which were submitted to plaintiff on April 12th, at the time [395] you made this exhibit? A. Surely.

Q. Are we to understand, Dr. Jones, that Plaintiffs' Exhibit 7 is based upon the press of Figure 5 of the Cole and McLaren patent and the process of that patent?

A. Yes.

Q. As I understand your testimony, Figure 5 of the patent in suit and the apparatus shown in Figures 1 and 2 of the patent in suit, are equivalents and relate to the same process?

A. I would not state that they are equivalents. They do relate to the same process; they are parts of the same patent. [396]

(Testimony of Charles L. Jones)

Q. And the press of Fig. 5 can be substituted for the press shown in Fig. 1?

A. It can be so substituted.

Q. And used to produce blocks of solid carbon dioxide? A. Yes.

Q. And the press of Figs. 1 and 2 of the patent is also for the purpose of producing blocks of solid carbon dioxide?

The Court: Just a minute, please. Will you read the question before leaving? Excuse me for interrupting, but I did not want you to go out yet. Go back and read that question from where he asks with regard to this Exhibit 7 and to its implications in so far as the patent in suit is concerned, the first question of this series.

(Record read by the reporter.)

The Court: "And the process of that patent," do you mean the method claims of the patent?

Mr. Miketta: Yes, your Honor.

The Court: Is that what you meant when you answered the question?

A. No; I did not particularize as to method claims or apparatus claims. In fact, it is the process and apparatus based upon the patent in suit, so far as I know.

Q. By Mr. Miketta: In other words, you consider the description in the claims to describe one method or a process, is that correct? A. No; I did not say that.

[397]

Mr. L. S. Lyon: I want to avoid this witness being interrogated about claims, because he has not been. I do not know that it would be proper for him to be interrogated about patent claims. There is no foundation laid that he is an expert on patent claims, and certainly we did not interrogate him on patent claims; and there-

(Testimony of Charles L. Jones)

fore, if counsel does so, he would be making the witness his own on that point.

The Court: Well, he made an answer there that I was not sure how it was going to be interpreted and I wanted to have it cleared up. I think counsel is entitled to clear it up, if it is not other than to make his answers clear. The objection will be overruled.

Mr. Morris: The question was inadvertently answered. May the answer be read?

The Court: Let us have the question and the answer read. Go back and read my question, and then what happened from then on, so there will not be any doubt in our minds as to what this witness testified to.

(Record again read as requested.)

The Court: Read that question again, because that is the unanswered question.

(Question read by the reporter as follows: "And the press of Figs. 1 and 2 of the patent is also for the purpose of producing blocks of solid carbon dioxide?")

Mr. Miketta: Now you may answer that question.

A. Yes. [398]

\* \* \* \* \*

Q. The process, as I understand it, Dr. Jones, in which you described on direct, I think, does consist of the following steps: You first close your chamber, and the closing of that chamber is illustrated from the position shown in chart I to that shown in chart II, is that correct?

A. Yes. We are reviewing, step by step, the testimony [399] of the direct examination.

Q. Yes; very briefly. And let us go over that very briefly. And the second step is: You admit gas to that chamber from the high-pressure line so that a pressure of 40 to 60 pounds is built up in the chamber, and that is

(Testimony of Charles L. Jones)

illustrated in sheet III of Plaintiffs' Exhibit 7, is that correct? A. As an optional step that is correct.

Q. Well, that is what you testified to?

A. I testified that that was an optional step; yes.

Q. Then, the third step which you testified to and which is illustrated, is that you inject liquid carbon dioxide into the chamber until the pressure is above 60 pounds, say, 70 to 80 pounds, or wherever you want to go; and that is shown in Sheet IV, is that correct?

A. I believe there was considerable volume of testimony in the record as to that step, pointing out that a variety of products could be made and the pressure in the chamber might be at atmospheric to make snow, or it might be at triple point to make slush, or it might be above the triple point to make the triple point type of product. However, in the principal cycle which was discussed you are correct: it was intended to produce the pressures you have stated.

Q. Very well. Then, the next step, No. 4 on my list, is to shove off the supply of liquid carbon dioxide when sufficient liquid carbon dioxide is in the chamber; and that is illustrated on sheet V, is that correct? [400]

A. That is correct.

Q. Then, the fifth step was this: That when the pressure dropped to 60 pounds, boiling off took place and snow formation automatically took place, is that correct?

A. Solid formation took place; that is correct.

Q. Solidification of the carbon dioxide?

A. Solidification took place.

Q. That can be said to take place, perhaps, during sheet V also? A. I believe so.

Q. Now, the next step, the step 6, is that step illustrated probably also on Fig. V chart, during which the



(Testimony of Charles L. Jones)

pressure drops in the chamber after boiling off until equilibrium is reached between the high-pressure line and the pressure in the chamber, is that correct?

A. Yes; correct.

Q. And after that point is reached, we then take as step No. 7, let us say, the step of closing the high-pressure line and opening the chamber to a low-pressure line or to atmosphere, I believe you stated?

A. That is correct.

Q. And that is shown on sheet VI. Then, the eighth step was the pressing operation which is illustrated on sheet VII, is that correct?

A. Yes.

Q. While the chamber is connected to this low-pressure [401] line or atmosphere, is that correct?

A. That is correct.

Q. And finally, as shown on sheets VIII and IX, the block is ejected and the chamber is opened and the block is ejected from the chamber?

A. That is correct.

The Court: Well, in between there they start lowering the plunger to force out all the extraneous matters?

Mr. Miketta: That is correct, your Honor.

The Court: Used as a means optionally of pushing out the block?

A. That is correct.

The Court: Your other point about the option between 2 and 3 is merely a question as to whether you put in your gas at the inlet or start it from the outlet?

A. Or from the outlet.

Q. From the high-pressure point?

A. That is all.

The Court: All right. I just wanted the record to be clear on that.

Mr. Miketta: In order to visualize this operation, your Honor, I would like to have the witness follow an

(Testimony of Charles L. Jones)

arbitrary time and chamber pressure diagram which we can draw as we go along, keeping these various points in mind of various steps.

(Mr. Miketta diagramming on blackboard.)

We will assume that he starts with a closed chamber: in [402] other words, forget about sheet I which shows it open and start with sheet II which shows it in a closed position.

Q. Dr. Jones, as you have testified, the first thing that you do is that you open the high-pressure line valve and permit equilibrium to take place; and, may we assume, instead of saying 40 to 60 pounds in that high-pressure line, that we have, say, 50 pounds; would that be satisfactory? A. No; you may not.

Q. You referred to 40 to 60 pounds. I would like to have you select the figure there in the high-pressure line.

A. You mean in the high-pressure outlet for unsolidified gas?

Q. That is right. And you are referring now to sheets II and III?

A. To sheet No. III of the exhibit. Yes; 50 pounds would be—

Q. 50 pounds would be satisfactory? A. Yes.

Q. Well, I will go backwards if you don't mind. We will assume that the chamber—it is proper, is it not, to assume that the chamber was at zero gauge and when you opened the valve to the high-pressure line the 50 pounds pressure rapidly rose in the chamber to, say, 50 pounds?

A. May I ask whether the time shown on the board is minutes or seconds?

Q. Just units. [403]

Mr. L. S. Lyon: Of what?

(Testimony of Charles L. Jones)

Mr. Miketta: You can say that they are minutes, if you so desire.

The Witness: That would not be days.

Mr. Miketta: But that would probably crowd it over a bit, would it not?

A. Definitely that pressure would be reached in a very few seconds.

The Court: Well, let us assume that the space between zero and 1 is the length of time it would take for the pressure to go from zero to 50, and that is your unit.

\* \* \* \* \*

The Witness: May I suggest that it be minutes and that your red line reach 50 in, say, about 10 seconds?

Mr. Miketta: All right, sir; I will try to do that. I [404] will move it over so as to be near to (diagramming further on blackboard). Is that better, Dr. Jones?

A. That is very good.

Q. So that at this point which we can call "A" you have established equilibrium of 50 pounds in that chamber, is that correct? A. Yes.

Q. Then, the next step which you perform is to introduce liquid carbon dioxide, is that correct?

A. Correct.

Q. And that causes pressure to rise to—will 75 pounds be satisfactory? A. Very good.

Q. And how quickly will it rise to 75 pounds?

A. Within another 10 seconds.

Q. Will it remain fairly constant there for a little while? A. Yes.

Mr. L. S. Lyon: That is not right starting up there.

Mr. Miketta: Let me have a little space on this, will you, please? It is a little difficult to crowd it all in so quickly. Will that be the—

(Testimony of Charles L. Jones)

Mr. L. S. Lyon: If your Honor please, that looks like it would take about at least three-fifths or four-fifths of a second, if "1" represents a second. The testimony shows it would take a tenth of a second for the first operation and a [405] tenth of a second for the next.

The Court: I think it is a little too delicate for his big piece of chalk. Let us make two of those represent that unit, and then it would be about right.

Mr. L. S. Lyon: Then, I would like to have him take that kink out there. There hasn't been any testimony that warranted that kink.

Mr. Miketta: Is this what you are referring to?

Mr. L. S. Lyon: That one right there (indicating).

Q. By Mr. Miketta: Is it not a fact that, as pressure reaches equilibrium, the rapidity with which it reaches equilibrium decreases as the rate of change decreases, Dr. Jones?

A. Oh, yes.

Q. For what length of time—now, you are going to keep that valve open until you have accumulated a sufficient quantity or admitted a sufficient quantity of liquid carbon dioxide into the chamber, is that correct?

A. Am I keeping this valve open or are you?

Q. Well, your third step was the injection of liquid carbon dioxide.

A. I mean, do you want me to tell you how long to keep it open, or do you want to draw the diagram and then ask me if it is correct? I am only trying to get at your own desire.

Q. According to the process which you have described, step 4 was the step of shutting off the liquid carbon dioxide [406] when a sufficient quantity of liquid carbon

(Testimony of Charles L. Jones)

dioxide has been accumulated in the chamber. You can set any arbitrary period of time.

A. It may be filled in one minute, let us say, which would end that operation about when you already have it, within about a minute and a half from the beginning, if the divisions are one minute each.

Q. All right. And let us call that point—I will try to letter it “liquid CO<sub>2</sub> shut off,” and that is that point. Where did the pressure curve go then, Dr. Jones?

The Court: Now, wait a minute. You are not going to have any straightening out of that line until you actually do put the shut-off, so that your shut-off ought to be back more closely to the top of the vertical line, and then it will remain constant for a certain length of time, anyway, won't it?

Q. By Mr. Miketta: Dr. Jones, for what reason will this remain fairly level for a short period of time?

A. During the filling, during the filling operation that will remain steady according to the proportion existing between the size of the inlet, the size of the outlet, and the pressure on the inlet gas while filling is taking place.

The Court: I got steps 1 and 2, but that was a third step that had not been explained on the diagram. I thought that was the next step you were coming to. That is bound to be true, of course, that, as it is adjusting itself, it is going to maintain a level pressure on the gauge? [407]

A. That is right.

Q. An even pressure on the gauge for a certain length of time. Now, what happens from then on?

Mr. Miketta: If your Honor will note, if I may add, that the high-pressure outlet is open throughout that period and the relative proportions between the inlet and the outlet openings reach equilibrium conditions again—



(Testimony of Charles L. Jones)

The Court: Yes.

Mr. Miketta: —so that your gas is going off all the time.

Mr. L. S. Lyon: I did not understand that, your Honor. I thought the witness testified that this thing was filled on a time basis, and not filled to an equilibrium; and that the introduction of the  $\text{CO}_2$  was an entirely timed proposition, as he testified to it, and there is no basis in the record for a statement that it is filled to an equilibrium.

The Court: Isn't it a distinction without a difference? One is the result of the other. In other words, that is what actually happens, though you do it on a time basis because you have no other standard of measurement; isn't that the reason?

A. You do it only on a time basis and this other is merely a description of what happens while we are doing it on a time basis, but it is shut off, the chart shows, because it is a minute and a half, not because it is 75 pounds, but it is because our time is up. [408]

The Court: It is because you have learned that in that length of time with a certain amount of pressure, a certain sized aperture, you are going to accomplish that in a certain given time? A. That is correct.

The Court: If you had some other means of measuring it, you would not do it by time, so time is just a sensible way of doing it? A. Yes.

The Court: So I think we come to the same.

Mr. Morris: I wonder if I could make an inquiry here. I wonder if that isn't the filling time and the time—at least, the impression I got was the time required to put in the quantity that you wanted. Now, the consequence of putting in what you want may be what your

(Testimony of Charles L. Jones)

Honor has suggested or as the record indicates. I wonder if your Honor would care to ask Dr. Jones which is which, because, otherwise I think the record is a bit uncertain.

The Court: I think we understand each other, but maybe not. Go ahead and explain it.

A. The steady pressure shown on the chart at 75 pounds is the consequence of the filling operation and not its cause, and it is continued by a time schedule until the time when the court has described, the desired charge has accumulated, and then shut off at that time.

Q. It is the consequence of the filling process plus the [409] lapse of time; in other words, you open up your valve and you let a certain amount of time elapse; what happens in the meantime? The pressure goes up to 75 and during that period of time the pressure levels off and then you turn off your valve?

A. That is correct.

The Court: I think that is clear in the record.

Q. By Mr. Miketta: After that liquid carbon dioxide supply has been shut off, Dr. Jones, the pressure drops to about 60 pounds and boiling off and solidification takes place, is that correct?

A. That is correct.

Q. How rapidly will that reach 60 pounds? That, accurately, is 60.4, is it not?

A. Yes. I should say in half a minute or less.

Q. By the Court: Isn't it the reverse? Isn't it the boiling off that causes the reduction in pressure?

A. As has been explained, the word "boil-off" has come to have rather a special meaning of the boiling off at the triple point, so that during the half a minute, which I think has just been correctly drawn on the board, we are reaching what we call a boil-off period at the end of

(Testimony of Charles L. Jones)

the second minute. Actually, in the meaning of the English word "boil-off", all the time we are reaching that period we are even boiling off during the filling period in the sense we have a boiling bath of carbon dioxide with some ebullition or boiling [410] taking place and more or less gas leaving the chamber. In the special meaning of the word, however, we do not reach the boil-off period on the chart until the end of the second minute, because then our first crystal of carbon dioxide is commencing to form. We have no solid in the picture until then.

Q. I see. Then, in the industry you use that "boiling-off" to technically mean the point that we have reached now at the crossing of the vertical and the horizontal lines?

A. It is only that part of the boiling while a solid is being produced, as it has come to be used.

Q. All right. Now, just one more question before we go on. What causes the drop in pressure from 75 to 60?

A. It is the relief of the gas through the high-pressure outlet which causes the reduction in pressure.

Mr. Miketta: Your Honor will note that we have stopped supplying anything to the chamber at this point.

The Court: I understand it is being drawn off.

Mr. Miketta: And it is still being drawn off, so that now the pressure is being reduced because the gases are being led off through the high-pressure outlet and nothing new is being added to that chamber.

Q. Is that correct, Dr. Jones?

A. That is correct.

(Testimony of Charles L. Jones)

Q. For how long a period, Dr. Jones, will the pressure in the chamber remain at about 60.4 pounds? [411]

A. That may be any period within the discretion of the operator.

Q. Will it not automatically terminate as soon as all of the liquid has formed or converted itself into snow, or that part which can convert has been converted into snow or solid?

A. It will. However, that can be made to take place very rapidly or very slowly, as desired. It is customary to occupy, say, three to four minutes in accomplishing that step.

Q. For the purpose of this drawing board can we cut it down to two minutes, Dr. Jones?

A. Yes, sir.

Q. During this period of time from two minutes to four minutes the pressure in the chamber is uniform at the triple point, is it not?

A. Yes.

Q. Which is 60.4 pounds?

A. Yes.

Q. Is that correct?

A. That is correct.

Q. And that is one of the physical properties, inherent properties of liquid carbon dioxide?

A. For pure carbon dioxide.

Q. During that period of time between two minutes and four minutes solidification has taken place, is that correct?

A. That is correct. [412]

Q. Now, I indicate that solidification, then, as sort of a precipitation from that horizontal line just like snow formation. The next step was to close the—no; to keep the chamber connected to the high-pressure line until equilibrium is reached again at, say, 50 pounds; and how long would that take ordinarily?

A. Approximately 10 seconds.

(Testimony of Charles L. Jones)

Q. So we will draw a practically vertical line here indicating that after the snow or solidification takes place, the pressure will quickly drop, is that correct?

A. All right.

Q. After reaching that point, then it is my understanding that you close the high-pressure line and open the chamber to the low-pressure line or atmosphere, is that correct?

A. Correct.

Q. Since we started with atmosphere, do you mind if I go down to the bottom now?

A. Not in the slightest.

Q. How long will that take?

A. That depends upon what you do with that gas. If you intend to waste it, you can get down there very fast. If you want to save it, you will go down at a rate dependent upon the compressor capacity you have available to take it away.

Q. May I just arbitrarily end up here at 5? Thank you, sir. So that this last line now indicates the drop in the pressure chamber to atmospheric, is that correct?

[413] A. All right.

Q. Dr. Jones, when you opened your CO<sub>2</sub> inlet at this point A, which I will mark "CO<sub>2</sub> inlet open," did some snow formation take place for just a very brief instant?

A. None whatever.

Q. Did some snow formation take place as you released that liquid CO<sub>2</sub> into an atmosphere at 50 pounds pressure?

A. I am afraid I shall have to change my answer. There still would be a possibility of some slight snow formation; yes. I really don't know whether you could get enough under those conditions to detect. Theoretically it is possible there might be some.



(Testimony of Charles L. Jones)

Q. I will just show a very tiny bit of snow dropped off there. Is that satisfactory to you?

A. If it is sufficiently tiny, it will be satisfactory.

Q. So that in this process which you have described in connection with Plaintiffs' Exhibit 7, the liquid carbon dioxide inlet was shut off before you accumulated any snow or any solidified gas, is that correct?

A. That is correct.

Q. And if a very small quantity of snow formed immediately after you opened your inlet, that small quantity was probably dissolved in whatever body of liquid carbon dioxide was collected in that chamber? A. Yes.

Q. So that for that brief period of time you may have [414] had what you referred to as snowflakes in a pond, I believe, on direct?

A. Until they dissolved; yes.

Q. At that point A, just before you opened your inlet for liquid CO<sub>2</sub>, that chamber was sufficiently tight to hold 50 pounds pressure, was it not? A. Yes.

The Court: Read that question, please.

(Question read by the reporter.)

Q. By Mr. Miketta: Will you please point out in the patent—

Mr. L. S. Lyon: Is that clear to your Honor?

The Court: Yes. I was not sure.

Mr. L. S. Lyon: The words "sufficiently tight" I understand would mean it was tight enough to hold 50 pounds, but not tight enough to hold 60.

The Court: I did not so interpret it.

Mr. Miketta: I object to counsel's inference.

The Court: He has not said anything about 50 to 60 pounds.

(Testimony of Charles L. Jones)

Mr. L. S. Lyon: I mean as to "sufficiently tight." Maybe your Honor understands it fully, but I am sure I do not.

Mr. Miketta: I think the witness understood it.

The Court: Then, the chances are I did not. I just thought I did.

Mr. Miketta: I would like to have counsel reserve some [415] of his remarks until he has a chance on redirect, your Honor.

The Court: Well, it is just what I told you, let every man conduct his own examination. I am limiting it to your question. Beyond that I am not going to have any imagination.

Q. By Mr. Miketta: Dr. Jones, will you please point out wherein in that patent there is any reference made to a high-pressure outlet connected to that chamber and a low-pressure outlet connected to that chamber?

A. I am very much afraid we are back to our definition of the schematic diagram. We have a single pipe 80 leading from the press chamber 50 and passing to a circle marked exhauster 81 and another circle marked diaphragm valve 84. The pressure and control characteristics in that pipe are determined by those two circles. I don't know whether I am competent to testify just what is inside the circle 81. I don't know.

Q. Does the patent tell you?

A. The patent defines it as an exhauster and says that it is used to maintain a definite pressure. As an engineer, if I were given the problem of maintaining a pressure in a chamber by attaching an exhauster to it, I would have a starting point from which to proceed to get such an exhauster and maintain such a pressure.

(Testimony of Charles L. Jones)

Q. But actually, you do not find two separate outlets or two separate lines, one of which is a high-pressure outlet and another of which is a low-pressure outlet, do you? [416]

A. No.

Q. In the process which you described in connection with Plaintiffs' Exhibit 7 and which has been illustrated on the board, you established a pressure of 50 pounds, or 40 to 60 pounds, as you stated on direct, in that chamber before you introduced any liquid carbon dioxide?

A. That is correct.

Q. Will you please point out where that is described in the patent in suit, that particular step of operation?

A. Oh, if counsel please, there are a great many things we have done with this press over a period of years that are not fully described in the patent. Our feeling with regard to it was that one of its principal merits was that it lent itself very flexibly and very adaptably to a wide variety of different schemes and hook-ups; and, to this day, many years after the patent was taken out, you will find individual plant engineers and operators exercising their own discretion, sometimes in violation of their direct instructions from their superiors as to how they will connect and operate a press in a particular case. But our feeling has been that one of the merits of the press is that it continues to deliver a good commercial product in spite of these vagaries.

The Court: Will you read that question, please, Mr. Reporter?

(Question read by the reporter.) [417]

The Court: Now, just for the record, how did you establish that pressure?

(Testimony of Charles L. Jones)

A. By opening the outlet valve marked "outlet for unsolidified gas—high pressure" in Fig. III of Plaintiffs' Exhibit 7.

The Court: Now you may answer the question.

A. I cannot point out to you this precise step in the patent in suit.

Q. By Mr. Miketta: You have already stated that in the process that you described in connection with Plaintiffs' Exhibit 7 a desired mass of solidified carbon dioxide is not collected in the chamber before the supply of liquid carbon dioxide is shut off; that is correct?

The Court: Read that question, please.

(Question read by the reporter.)

A. It is a sort of an upside down statement. I didn't remember of saying that.

Q. By Mr. Miketta: May I rephrase it? Do you understand the question, though?

A. I think I made the positive statement that the inlet was shut off when the desired amount had been accumulated.

Q. Well, will you please point out where that occurs?

The Court: Well, let's see. Let's see now. I'am not so sure that that is so, myself. I think you said the shut-off occurred when the desired mass had been accumulated.

A. Yes; the desired time had elapsed would be more [418] accurate, because actually the man operating the machine has no knowledge what is in that chamber except by inference. He turns it off by the clock.

Q. By experience, he relates it to a question of time, and when that time has elapsed you shut it off and let the Lord take care of what happens?

A. That is correct. [419]

(Testimony of Charles L. Jones)

Mr. Morris: May I inquire whether the questions are being answered as to a triple point operation, in which the liquid is charged in mass, or whether the questions include an alternative of the snowing process where the liquid is vaporized as it passes into the chamber? It seems to me the questions are being asked on one theory at times, and are being answered on another. I don't personally know whether the questions call for a triple point operation, or snowing operation.

Mr. Miketta: I think, your Honor, I have been very careful in this line of examination to adhere only to the process described in Plaintiffs' Exhibit 7, and now illustrated on the board. You so understood the questions, did you not?

A. I specifically stated, in connection with Plaintiffs' Exhibit 7, on direct examination, and again today that Plaintiffs' Exhibit 7 was in no way limited to the triple point operation, and I described in connection with it all three common types, and said that it could be used for any of the six methods described in the section from my book read into the record this morning from pages 206 and 207.

Q. Referring to the operation and to the process which is illustrated on the board, and which you testified constituted a process to be carried out in accordance with Plaintiffs' Exhibit 7, and limiting this question to just [420] Plaintiffs' Exhibit 7, your testimony thereon and the process as illustrated on the blackboard, is it not a fact that the step of shutting off the supply of liquefied gas to the chamber takes place before you make any solidified carbon dioxide? A. It is.

Q. Therefore, you do not shut off that valve to stop production of solidified carbon dioxide, but actually shut



(Testimony of Charles L. Jones)

off the supply of liquid carbon dioxide in order to initiate the production of carbon dioxide at a subsequent time?

A. As you have limited your question on the cycle illustrated in the graph drawn on the blackboard by counsel, the answer is yes.

Q. So that in the process which you have described, and which is illustrated on the board, the step of shutting off the supply of liquefied gas to the chamber to drop production of solid and gas therein after a desired mass of the solid has accumulated in the chamber, does not take place; is that correct?

Mr. Morris: I am objecting to it because the question assumes these words "according to the process you have described, and as shown on the board." I have not understood Dr. Jones to limit his description to a triple point operation. In fact, his direct testimony is that the apparatus may be operated in the snowing operation from atmospheric or sub-atmospheric to just below the triple point; then the [421] slush operation, the triple point, and the solid is just above the triple point. If the learned counsel is going to put in the two things "as you have described and as shown on the board," there is going to be a confusion.

The Court: What, Doctor, did you think you were permitting counsel to display? Suppose you give that the next letter, Mr. Clerk, for identification. I would like counsel to have that reproduced on a sheet of paper.

The Clerk: The chart do you mean?

The Court: Yes. What is the number of it?

The Clerk: G.

[Note: Defendants' Exhibit G will be found in the Book of Exhibits at page 1366.]

(Testimony of Charles L. Jones)

Q. By Mr. Miketta: Exhibit G shows the time pressure cycle in making the so-called triple point solid carbon dioxide—one of the processes which may be employed.

The Court: With that understanding I think you may read the question.

(Question read by the reporter.)

A. That is correct.

(Short recess.)

Q. By Mr. Miketta: Dr. Jones, is it not true that the step of shutting off the supply of liquefied gas to the chamber to stop production of solid and gas therein, after a desired mass of the solid has been accumulated in the chamber, is the step used in carrying out the Martin snow tank operation? A. Yes. [422]

Q. And it is the same step that was used by me in making snow in a canvas bag, was it not?

A. Yes.

Q. In the press which you have described, and illustrated in Plaintiffs' Exhibit 7, can you, by manipulating the valves cause that boil-off to take place at any other pressure but 64.4 pounds?

A. You can eliminate it altogether and cause the corresponding phenomenon to take place at any pressure you wish, as long as it is not over 60 pounds.

Q. Let us assume, Dr. Jones, that we have gone through the stage of admitting gas into the chamber; we have opened our liquid CO<sub>2</sub> inlet, and we have reached the point at 75 pounds where you have cut off your liquid CO<sub>2</sub> supply, and the pressure stops dropping, can you, by manipulating any valves from that point on, cause

(Testimony of Charles L. Jones)

formation of snow or solidification to take place at a pressure other than 60.4 pounds?

A. No, you cannot change the triple point of the material.

Q. The triple point is 60.4 pounds, is it not?

A. It is.

Q. And that is one of the natural inherent properties of liquid carbon dioxide?

A. Yes, if it is pure carbon dioxide. I don't know that I go along with stating the decimal point, and taking [423] the four-tenths of a pound too seriously, because it is not uncommon to have enough impurities in the material to cause that point to be anywhere from 59 or 62 or 63 pounds.

Q. Due to the presence of impurities?

A. Due to the presence of impurities.

Q. Just like salt water will boil at one temperature and distilled water will boil at a slightly different temperature; is that correct?

A. That is correct.

The Court: You answered, Dr. Jones, just a short time ago, and said that you could cause the boil-off to take place at any point below the 75 pounds.

A. I meant that he apparently was leading me through a particular diagram which he has placed on the board for a particular process called the triple point process, and that the chamber might be filled with snow at atmospheric, 20, 30, or any other desired pressure, but not above the triple point. He then limited his question to the diagram shown on the board, and I answered him that it could not be changed from the pressure he showed.

Q. In your explanation there, Dr. Jones, you refer to the fact that in the ordinary, let us say, Martin snow

(Testimony of Charles L. Jones)

tank process, you can make ice or snow at any pressure below 60 pounds; is that correct?

A. Counsel, in injecting the Martin snow tank process now in connection with the diagram on the board, are we dis- [424] cussing the Cole and McLaren press, or the Martin snow tank?

The Court: Eliminate the reference to the board and read the question.

Mr. Miketta: Let me reframe the question: The explanation you just made, Dr. Jones, when you stated that snow could be made, and solidification of liquid carbon dioxide could take place, at a pressure below 60 pounds, you referred to a process where liquid carbon dioxide is injected into a tank at a lower pressure, and snow formation takes place at a pressure of, say, 15, 20, 30, 50 or up to 60 pounds? A. I did.

Q. Is that correct? A. Correct.

Q. Referring to the diagram, Exhibit G, after the pressure in the chamber has dropped to atmospheric, as indicated by the red line hitting the bottom at 5, the next point in the process was to press or compress that snow or solid carbon dioxide, was it not? A. It was.

Q. So we can indicate a press operation by a horizontal red line along the zero line, and I will mark that "pressing." I call your attention specifically to chart 2 of Plaintiffs' Exhibit 7, wherein the closing head is shown spaced from the inner wall of the chamber. Do you notice that?

The Court: No, the plunger?

Mr. Miketta: The closing head also, your Honor, seems [425] to be spaced from the walls of the cylinder, or the walls of the chamber.

(Testimony of Charles L. Jones)

A. There is some clearance in every case. There must be, to make an operative device.

Q. I also call your attention—

The Court: You mean the top part of the closing head, the inner part of the closing head?

A. The boss.

The Court: That corresponds to the plunger?

Mr. Miketta: Yes.

A. You will observe, however, that the clearance between the boss and the lower mouth of the boss of the chamber is indicated nowhere near as great as the clearance between the plunger and the chamber. That, I may say, is purely accidental. I see no importance to the whole point unless there is some pointed out to me that has not yet come out.

The Court: What do you mean,—having any clearance at all, or do you mean the difference between the space between the plunger and the side wall and the top of the closing head of the side wall?

A. No, I mean that the record will show that we have stated the clearance around the plunger is there for the purpose of permitting release of gas and its recapture in the system. When we come to the boss or upper surface of the closing head, which seems to be the present question, [426] we have shown it with an appreciable clearance, and presses have been variously constructed with considerable clearance, some with bakelite plates at that point, some with no boss at all on the lower chamber, and I am merely stating that in the presses the amount of that clearance is not a vitally important point in the operation of the apparatus.



(Testimony of Charles L. Jones)

The Court: It doesn't make any particular difference whether there is any clearance there at all, except for the ability to get it inside the sidewalls of the chamber?

A. That is correct.

The Court: You can't accomplish any mechanical purpose than to get it in? A. That's right.

Q. By Mr. Miketta: Let us refer to the specific sheets A and B, which are a part of Plaintiffs' Exhibit 7. I understand your testimony to be that sheet A describes a completion of the pressing operation, during which the bottom closing head is first lowered slightly, and then raised during the completion of the pressing, so as to give the bottom squeeze effect; is that correct?

A. That is correct.

Q. If there is clearance between that boss or closing head and the inner walls of the chamber, gas escapes through that clearance, doesn't it?

A. If there is such clearance, gas does escape.

Q. Is it of any importance in the manufacture of the [427] dense block?

A. Whether that gas escapes, or can escape, or not?

Q. That is what I mean, yes.

A. The answer is, a very, very slight difference. Ample provision has been made in this design for the escape of gas, in other words, around the upper plunger, and in so far as it is practical to do so it is much preferable to permit that gas to vent upwardly around the upper plunger and return to the compressor system rather than to permit it to escape freely around the lower closing head, and be lost.

Q. I believe you have stated that the bottom head pressing is not described in the patent in suit?

A. It is not.

(Testimony of Charles L. Jones)

Q. Sheet B describes another modification, in which apparently you permit the closing head to move downwardly, or lower it slightly, and then allow the compressed block of carbon dioxide to detach itself from the walls and drop on the closing head?

A. That is correct.

Q. Do you find that modification described in the patent in suit? A. No, I do not.

Q. Referring again to sheets 6 and 7, you have described in connection with Exhibit 7, that pressing of the solidified material takes place after the pressure in the [428] chamber has been reduced to atmospheric, that is correct, is it not?

A. No, I have not so testified. I believe that my testimony was that the low-pressure outlet was open, and therefore the pressure— [429]

Q. Dr. Jones, I think it was at your suggestion, and with your approval, that we indicated that the pressure of the chamber was zero, and that pressing started after the pressure in that chamber came down to zero, down to atmospheric pressure.

A. Oh, yes, I would have permitted you with equal freedom to have designated that as anywhere between zero and five pounds. That, however, is your cycle; not mine.

Q. I would like to call your attention to your testimony, where you have testified in connection with sheet 6—

Mr. L. S. Lyon: What page?

Mr. Miketta: I will find it.

Q. Is it not a fact that you have testified in connection with this triple point process, on Plaintiffs' Ex-

(Testimony of Charles L. Jones)

hibit 7, that the low-pressure line shown on sheet 6 of Exhibit 7 was open to atmosphere?

A. That is correct, open to atmosphere or—

Mr. L. S. Lyon: I object to that as not a proper method of examination; not a proper method of proving what the witness testified to. We have the transcript of the record here, and if the witness is to be examined as to what he has testified to, he is entitled to see the transcript.

A. What worries me is, he is shortening my testimony by giving only a part of it.

Mr. L. S. Lyon: Wait a minute. The witness can be asked if the fact is true, but I don't believe he can be asked [430] if he testified so and so.

The Court: He can be asked, and he can answer, if he wants to. There is no objection to his answering, if he does not object to it, and someone else is not objecting.

Mr. L. S. Lyon: I am objecting.

The Court: The objection will be sustained.

Q. By Mr. Miketta: In testifying regarding sheet 6, Mr. Jones, on pages 287 and 288 you stated as follows:

“Passing to No. VI, marked ‘start of pressing period’, the CO<sub>2</sub> inlet remaining closed, in this step the high-pressure outlet has been closed and the low-pressure outlet opened. This operation is schematically shown here as two presumably manually-operated valves. However, in plants operating today this may be accomplished by a remote control, pneumatically-operated valve; it may be accomplished by a pressure-reducing valve mounted on the compressor in such a fashion that when flow stops through the high-pressure outlet the compressor is automatically transferred to the low-pressure outlet; in other

(Testimony of Charles L. Jones)

instances the low-pressure line is opened to the air or to a convenient part of the process system, where it may be recovered to where it flows away."

You testified in that manner, did you not?

A. Yes, indeed.

Q. That was the start of the pressing period?

A. That's right. [431]

Q. And pressing started after that low-pressure valve was opened?

A. That is correct. I find no place where I have stated that the valve is connected to atmospheric pressure, however. I said it is put into part of the compression system, as you have read my testimony.

Q. Let me quote it again: "In other instances the low-pressure line is opened to the air." What is the meaning of that? A. It is self-evident.

Mr. L. S. Lyon: That is not complete.

A. It is part of the statement.

Q. By Mr. Miketta: Does that mean that it is opened to atmospheric pressure?

A. That is a misstatement.

Q. I show you your testimony, Dr. Jones, so that there is no question as to what you have testified about.

Mr. L. S. Lyon: I call your attention to the fact that the predicate for the sentence is "in plants operating today" so and so is true.

Q. By Mr. Miketta: When you stated that that was opened to the air, did you mean that it was opened to atmospheric pressure? A. Yes.

Q. And after it was opened to atmospheric pressure, then the pressing operation started by the downward movement of [432] the pressing plunger, is that correct?

(Testimony of Charles L. Jones)

A. My statement is not so limited, but since your question is so limited, I have answered yes.

The Court: As I understand your statement is in the alternative; it might be opened to the air, in which event it would be diffused and lost, or it might be opened to some type of storage for the sake of saving. At any event, it would be a very low pressure; it might not be atmospheric pressure. Conceivably it might be at five minutes pressure? A. That is correct.

Q. Still it would not interfere with the operation of the device? A. Not at all.

Q. But it has to be a very low pressure in order for the apparatus to work? A. That is correct.

Q. I was only talking about an alternative of its being opened to the air. If it is opened to the air naturally the pressure is atmospheric pressure?

A. That is correct.

Q. By Mr. Miketta: After that chamber has been opened to atmospheric pressure, which we have indicated at the five-minute line on Exhibit 6, then the pressing operation starts, is that correct? A. Correct.

Q. So that you actually press the solidified carbon [433] dioxide while the chamber is at a low or atmospheric pressure? A. That is correct.

Q. Will you please refer to the patent in suit, and specifically point out where the patent teaches you to reduce the pressure in the chamber to atmospheric before pressing the block?

The Court: Change your question to read to atmospheric or to very low pressure.



(Testimony of Charles L. Jones)

Q. By Mr. Miketta: Or to a very low pressure. Thank you, your Honor.

A. On page 2, line 9 of the patent, and I am reading: "The exhauster 81 drives the low-pressure gas to an expansion tank 82."

Q. By Mr. Miketta: Is it your present opinion, then, that line 80 is at a very low pressure?

A. We have presented line 80 as a schematic illustration of a pipe. I don't believe that that pipe can be limited to any particular pressure, unless the patentee so limited it himself. I am sure I don't know how wide a range of pressure might exist in line 80. However, at this time of the cycle the point which I have just read indicates that at that time the exhauster drives the low-pressure gas to an expansion tank, implying that at that time line 80 is at a very low pressure.

Q. Line 80 is the only line attached to the snow chamber 50, is it not? [434]

A. And may, at different times, be operated at different pressures.

Q. Do you find any statement in the patent which tells you that the line 80 operates at a different pressure at different times? A. I can't say that I do.

The Court: Let us say that gas escapes from chamber 50 to the openings 52 into the jacket which is 53; then it gets from there into the pipe 80, doesn't it?

Mr. Miketta: That is correct, your Honor.

A. Yes.

Mr. Miketta: Fig. 2 shows that very clearly.

The Court: Now, it is going to have in conduit 80 approximately the same pressure it had in 53 and 52 and 50, isn't that correct?

(Testimony of Charles L. Jones)

A. I should say yes. I think that I may only just state, so far as I know, there naturally is no disclosure in the patent of many of the variations or permutations or methods of using the apparatus, which have since been used by the industry. In other words, so far as I know, this patent is not a complete disclosure of the modern practice of utilizing this device.

Q. When the patent states: Mechanically-applied pressure to the mass of solidified gas in the chamber, while the chamber is closed, to press the mass into a dense block of solidified gas, and finally opening the chamber to the [435] atmosphere and removing the completed block therefrom,—doesn't that mean that the compressing takes place while the chamber is closed to the atmosphere?

A. Are you reading from a claim now?

Q. Will you repeat the question?

(Question read by the reporter.)

Mr. L. S. Lyon: If your Honor please, I think the witness has a right to find it in the patent, or has a right to have it pointed out in the patent, the statement, and what the context is.

The Court: He can, if he needs it; if he doesn't need it he doesn't have to.

A. I would like to know what claim is being read to me.

Mr. Miketta: Do you understand the question, Dr. Jones?

A. I understand it, but it is a part of a statement taken from a longer statement, which may or may not be a patent claim, or may or may not come from the patent in suit. I would like to hear the whole statement; naturally, I am suspicious of a phrase.

(Testimony of Charles L. Jones)

Q. It is a complete statement, is it not?                    A. No.

Q. I am just asking about that step of applying pressure to the mass of solidified gas in the chamber, while the chamber is closed, to press the mass into a dense block of solidified gas, and finally opening the chamber to the atmosphere. —What do you get from that statement in the [436] patent I have just read to you?

Mr. L. S. Lyon: I submit the witness is entitled to either have the statement located in the patent for him, so that he can see what the context is, or he has a right to have the language read, and to find it. If it is a statement in a claim, we object to it upon the ground that the witness has not been put on the stand to interpret the meaning of phrases in this patent. We have not qualified him to do so. We have not tendered him in any such function, as that is a matter for the court rather than the witness, in any event.

The Court: The objection is sound. I don't think he has been qualified. If he had been qualified, he would be usurping my function, so the objection will be sustained.

The Court:    \*   \*   \* [437]

\*       \*       \*       \*       \*       \*       \*       \*

Now, this man has been put on the stand primarily as a factual witness. He has testified as to an apparatus with which he was familiar, which very apparently is a part of the art during the period of which he was speaking. He also said that the apparatus was made after the indications in Fig. 5 in this patent in suit. Then he produced Exhibit 7, which is a motion picture of his idea of Fig. 5 in that patent. In other words, it is the

(Testimony of Charles L. Jones)

way the apparatus operated to accomplish a certain objective,—am I correct, so far? A. That's right.

The Court: He only is an expert to the extent that on direct examination he described this particular apparatus; he indicated, even on direct examination, that he was not interpreting the claims; that he was simply showing how this particular apparatus, with which he was familiar, operated. I might not think that the apparatus was covered by the claims at all. I don't know what I am going to think, but just assume that I do not; many times an apparatus is made which [438] some man thinks is disclosed by the patent claims, and it is not disclosed at all. He is making something that is not covered by any patent disclosure.

I think the objection is sound. This man is not qualified as an expert in the interpretation of claims. I doubt very much if there is any benefit to be derived from cross examining him to attempt to determine by him whether or not this apparatus that he has indicated in his Exhibit 7 is disclosed in the patent. [439]

\* \* \* \* \*

The Court: \* \* \* You indicated your qualifications to testify here as an expert; you indicated your experience with a particular manufactured product, so that you might be able to testify factually as to what you have actually observed. Now, without any particular regard to the patent in suit, you testified as to a certain apparatus which, in your view, and by your reference, was the apparatus indicated in Figure 5 of the patent. You didn't make any references to any statements with regard to the claims of the patent, and you did not attempt to indi-

(Testimony of Charles L. Jones)

cate what was disclosed by the drawings of the specification as to the claims of the patent. Is that correct?

A. That is correct.

Q. Now, you went from there to a description as indicated in the schematic drawing, Exhibit 5, of your idea of how Figure 5 worked, as you saw it applied in the industry?

A. That's right. [441]

The Court: Purely as a matter of how you saw this thing done. That was a factual proposition, and you were simply giving me a moving picture of the operation.

A. Of the operation.

Q. And you stopped there? A. Yes.

The Court: I don't that he has qualified himself as an expert on this patent, or on the reading of the patent. That is going to be my job ultimately. Now, you have examined him on cross examination at length with the objective, I presume, of ultimately showing me that what he has described is not covered by the patent.

Mr. Miketta: Yes.

The Court: That is ultimately what you are going to do. Well, leave that to me. I don't feel that this is proper cross examination of this particular witness.

Mr. Miketta: I am simply attempting to elicit additional facts from him, your Honor, as to the operation of the equipment to which he has testified.

The Court: If you want to go further into the factual situation, or if you want to go further into the operation of the particular device which he has described, do so, but don't read him a portion of a patent claim, and say to him, Did that apparatus do that? Because I think that is what I have got to do in this case, if I understand what my responsibilities are. You may know these things a lot better [442] than I do. I have had a little



(Testimony of Charles L. Jones)

hesitation in indicating my views, and I am just doing it from my broad experience in the trial of all sorts of cases, and, after all, the principles of pleading and proof are exactly the same, whether it be damages to a cow, a mail fraud case, or a patent case. I just have to keep within those particular issues, and the witness goes on the stand and testifies to one part of it, and then we piece the things out, as we go along; and I have indicated, I think, fully the scope of your testimony on direct examination, have I not? A. That is correct.

Mr. Miketta: As I view your Honor's remarks, I would like to go over my notes, and expedite the further examination as much as possible.

The Court: I am not trying to limit your cross examination. I am the easiest man in the world to get along with on cross examination, because I don't like to unduly limit it, if I think we are getting information, but I think you have got to keep in mind all the time the scope of the direct examination, and then apply the cross examination to it.

Mr. Miketta: I have a copy here of the diagram placed on the board, Exhibit G for identification, and I would like to have that marked in the same manner.

The Court: Let the other side see it, and then offer it tomorrow morning. It is just to illustrate his testimony? [443]

Mr. L. S. Lyon: It is not a correct copy.

Mr. Miketta: I suggest that I confer with Mr. Lyon as to any inaccuracies, and we can iron them out.

(An adjournment was taken until Wednesday, May 10, 1944, at 10:00 o'clock a. m.) [444]

Los Angeles, California, Wednesday, May 10, 1944;  
10:00 a. m.

(Parties present as last noted.)

The Court: Are there any *exparte* matters? If not,  
you may proceed.

CHARLES L. JONES,

recalled.

Cross-Examination

resumed.

Q. By Mr. Miketta: Dr. Jones, from your testimony I have gathered that the strength of the walls of the chamber in which solidification of a gas takes place is a necessary factor which should be and must be considered?

A. That is correct.

Q. And among other necessary factors to be considered in building a machine for the solidification of gas is, perhaps, the size of the chamber with respect to the size of the inlet openings and outlet openings?

A. That is correct.

Q. Would you consider also the rate at which liquid gas is supplied to the chamber and the rate at which the unsolidified gas is withdrawn?

A. That is correct.

Q. Another factor which controls the resultant operation is the type of nozzle used. is it not?

A. That is correct, if any.

Q. Pardon? [445]

A. I added the words "if any."

Q. If any?

A. The type of nozzle used, if any.

(Testimony of Charles L. Jones)

Q. Well, does it make any difference whether a nozzle is employed or not?

A. If the liquid feed is at a sufficiently low pressure so that no restriction in the line is necessary, it makes no difference.

Q. So that you may say the kind of an inlet that you have is a factor to be considered with respect to the pressure of the incoming and liquid gas, is that correct?

A. That is correct.

Q. In your previous answer you have also considered, I take it, the size of the inlet opening?

A. That is correct.

Q. Another necessary factor to be considered, I believe, is the outlet for the unsolidified gas?

A. That is correct.

Q. And by that you specifically refer to the size of the outlet with respect to the inlet opening, is that right?

A. No. Your statement is not sufficiently inclusive, that is to say, if the outlet is big enough to do the work, it makes no difference whatever how much larger it is if somewhere in the line there is a suitable means for controlling the pressure in the chamber or the flow from it.

Q. By the Court: Well, that is just another way of saying [446] the outlet opening, the size of the opening in the outlet. If you have a valve in it that controls the size, what difference does it make whether the opening is in the valve or the opening is at the point of outlet?

A. None. I am only trying to avoid being limited to the size of outlet on the side of the chamber. The outlet in the sense of the whole portion of the apparatus by which the gas escapes, your answer is correct.

(Testimony of Charles L. Jones)

Q. Now, let me ask a couple of questions here. As I understand it, the source of the carbon dioxide is a shell or an evaporator in which the liquid is held under its own vapor pressure, 70 or 80 degrees. If you insert that into a chamber so close to its own freezing point that if you release it suddenly in atmospheric pressure, ordinary atmospheric pressure, you are very liable to have trouble with it?

A. You are going to freeze it up; yes. You will freeze up your inlet line.

Q. You are going to freeze up your inlet?

A. That is right.

Q. It doesn't make any difference whether it is in the form of a nozzle at the outlet or whether the opening is restricted, it operates just as a nozzle, anyway, doesn't it?

A. No, sir; I would not say so, that is, if you have cold liquid and lower the pressure in the chamber, when a nozzle is used at or near the face of the chamber, the pressure *drop*, and therefore the cooling effect, takes place in the [447] chamber. When that nozzle is omitted, that boiling and that cooling effect may extend all the way back through the feed pipe; so that when a nozzle is used and when trouble is encountered, the freezing is at or near the nozzle; when no nozzle is used, the freezing may extend back 10 or 15 feet from the press and involve filling in the pipe and connections with solid. Is that clear?

The Court: Yes, I understand that; that's right. I guess you did not understand me. It doesn't make any difference whether you have something, like on the end of a hose, which we call a nozzle, or whether you just

(Testimony of Charles L. Jones)

gradually restrict that at the point of outlet, the size of that opening operates as a nozzle anyway, doesn't it?

A. Yes.

Q. What you use this outlet for is to get a counter pressure, to have a little pressure in that tank to avoid that tremendous drop?

A. That's right.

Q. That is what that is used for?

A. Yes.

Mr. L. S. Lyon: Does your Honor understand—I am not sure that it is clear, that the witness testified the nozzles are not used at all with certain operations. I think the witness might clarify what your Honor has inquired about now, if he will explain under what circumstances nozzles are not necessary, and when they are used. [448]

The Court: If I am not interrupting you, Mr. Miketta.

Mr. Miketta: Not at all.

A. In making snow ice, that is, in filling the chamber below the triple point pressure with snow, a nozzle is invariably used, and the exact length, shape, and size of that nozzle is important. The use of an incorrect nozzle, incorrectly placed, will make quite a difference in the likelihood of trouble. When the triple point operation is practiced, however, the use of the nozzles becomes optional, if the liquid fed is sufficiently cold, so it is merely a question of transferring the liquid from one vessel to another. There would be a moderate difference in pressure between the two. There is no solidification during the filling period under the triple point operation, at all, except for the impurities,—water and oil in the liquid.

The Court: Which freeze at a higher temperature?

A. Which freeze at a higher temperature.



(Testimony of Charles L. Jones)

Q. By Mr. Miketta: In speaking of the outlet for unsolidified gas, as I understand your testimony, one of the things to be considered is whether provision has been made to associate that outlet with, let us say, a point of disposal for or with the atmosphere and the low-pressure outlet?

A. That is correct.

Q. Let us say, in instructing a man how to operate any of these various methods of solidifying a gas, there are other necessary factors, are there not, such as the type of [449] liquefied gas to be used? Isn't that a necessary item to be considered?

A. Hardly. In instructing a man in a plant, you have a plant that is producing indefinite liquid gas, and he has no choice about it. You tell him what to do, and he has been instructed.

Q. Let us say, in outlining the operation to be carried out, one of the first things that you necessarily have to do is to establish the type of liquefied gas to be employed in this prospective operation, is that correct?

A. I am not sure that it is clear. What do you mean by establish? You start to build a plant, to make solidified carbon dioxide. I suppose the first thing you have to do is to establish the fact that you are going to build the plant at all. You don't build the plant, and then decide what sort of gas you are going to solidify, no.

Q. Assuming that you are simply intending to solidify a gas, generically, the first thing you do is to determine what sort of gas you are going to use, is that correct,—whether you intend to solidify hydrogen, oxygen, methane, or liquid CO<sub>2</sub>, or just what? Isn't that the first thing to be decided?

A. I don't know that that is a question that has any answer. The situation would never come up.

(Testimony of Charles L. Jones)

Q. Why not, Dr. Jones?

A. Let us get on with it by answering yes, that is correct. That is the easiest way to dispose of it. [450]

Q. Would you also consider the temperature of the liquefied gas to be supplied to the machine?

A. That is correct.

Q. And the pressure at which it is to be supplied?

A. That is correct.

Q. I gather from your testimony that you would also consider the amount and type of impurities present in this liquefied gas, depending upon the use to which the resulting product is to be put?

A. That is right.

Q. Would you also consider, as one of the factors, the pressure which is to be maintained in the chamber before supplying or admitting the liquefied gas thereto?

A. That's right.

Q. And another necessary element or factor to be considered is the pressure existing in the chamber during the formation of the solid product?

A. Those are all factors which must be taken into consideration at some time or another. For the most part they don't have to be considered in advance of constructing the apparatus, or even commencing to use it, because many of those factors, which seem to be just a list of variables that affect the operation, can be considered, and can be changed from time to time after the equipment is installed, without any physical change in the apparatus.

Q. Would you say that some of those factors you would [451] eventually determine as a matter of experimentation?

A. Yes, I presume so.

Q. One of the factors which control the operations and results obtained would be the pressure to which that solidified gas is compressed, would it not?

A. Yes.

(Testimony of Charles L. Jones)

Q. Would you also consider, as a factor in the operation, as one to be considered, whether or not the pressure in the chamber is reduced or released before the pressed block is ejected or removed from the chamber?

A. Yes, that is another variable.

Q. Dr. Jones, when did you observe the various operations and methods which you have described on direct examination, and on cross-examination, with respect to Plaintiffs' Exhibit 7 and its various adaptations shown in Sheets 1 to 9 and A and B?

A. The most recent instance was in the Los Angeles plant of the Liquid Carbonic Corporation, on last Monday or Tuesday, immediately preceding the trial.

Q. When was approximately the first time that you observed these methods being carried out?

A. In January of 1929.

Q. Where was that?

A. In the Long Island City plant of the General Carbonic Company.

Q. In that period of time have you observed any [452] substantial change in the process as indicated by your Exhibit 7?

A. No; I have observed that in different plants under different conditions different types of product were preferable. For instance, three years after the introduction of the triple point process, one large operation was swung completely back to the manufacturer of snow ice, because of the characteristics and properties of that ice being more desirable for the particular impurities that occurred there. On other occasions I have observed where the plant goes back to making slush ice, because of the difference in character of the raw material. I wouldn't say the process has been used without variation throughout that time. I

(Testimony of Charles L. Jones)

have observed, however, no fundamental improvement in the machine, and no change other than refinements of detail.

The Court: They were all Cole and McLaren machines? A. Yes, sir.

Q. By Mr. Miketta: By whom were those machines made, Dr. Jones?

A. By a number of manufacturers; the Cresson-Morris Company; the South Works Foundry and Machine Company; the Hydraulic Press Manufacturing Company; the Frick Company; the York Ice Machinery Corporation; the Charles Elms Engineering Works. That's about the list.

Q. Dr. Jones, you have referred to slush ice. Frankly, I still don't understand just what is embraced by this term, [453] and I would like to have you, if you don't mind, state again what you mean when you refer to slush ice.

A. Taking the defendants' Exhibit G, I guess it is, if the size of the outlet is increased in that example and everything else left the same—and by size of outlet I mean the characteristics of the outlet system, not merely the diameter of a pipe—so as to take the gas away more rapidly, if this change is made gradually and a series of blocks be made, the first thing that will be observed is that the filling pressure will be reduced. For example, we might make one block exactly as shown; the next block might have a filling pressure of 70 pounds.

Q. You mean this maximum would be reduced to 70?

A. Yes.

Q. Yes.

A. Everything else remaining the same; the next block might have a filling pressure of 65 pounds, everything else

(Testimony of Charles L. Jones)

still remaining the same; the next block might have a filling pressure of, say, 61 pounds. We would still be making triple point ice. The next reduction or the next increase in outlet rate would not produce a further decrease in filling pressure. The filling pressure would remain at the triple point but the length of the horizontal line representing the boil-off period would be decreased. That would then be in the slush range, the meaning of the shorter time being that part of the solid would be formed during the [454] filling period.

Q. In other words, instead of a very small amount of snow being formed immediately after the CO<sub>2</sub> inlet is opened, a larger quantity would be made?

A. A mixture, a mixture of liquid and solid CO<sub>2</sub> would be made throughout the filling period, which explains the use of the word "slush" to describe the product. If the outlet be further increased, the boil-off time is progressively less, giving a series of blocks made with drier and drier slush in the chamber, that is, a higher and higher proportion of the solid to liquid, until a block would be reached in which the pressure would go down as soon as the inlet valve was shut off. We would then have a block of snow ice; in other words, all of the solid would be formed while the liquid is entering the chamber.

Q. But even though you have what you term slush ice when, let us assume, the pressure just goes up gradually here to 60 pounds and moves down again quite rapidly, the ice or the product which you are pressing is not a slush; it does not contain any liquid at that point, does it?

A. No; it does not. It has the characteristics of the block of snow wet down with water and frozen in a block in a box referred to by counsel, I think, in connection with a snow fort.



(Testimony of Charles L. Jones)

Q. Is it not a fact that some attempt was made to press a slush ice as a slush at Niagara Falls at one time, with the [455] result that the blocks exploded or disintegrated upon shipment?

A. No. No. Let's see; just give me a minute. A number of expedients were tried at Niagara Falls plant involving variations in impurities and methods of pressing, which resulted in a very large number of exploded and fractured blocks. Some of these were made with pressure, some without, some snow ice, some slush ice, some pressed at the pressure of the room, and some pressed at higher pressures. When the block, regardless of the type of solid, was pressed with internal pressure in the chamber it was necessary to bring the pressure down gradually or the condition mentioned will occur, that is, the block will explode from internal pressure. Does that answer your question?

Q. Thank you. Just one more question. Can you give me the name of the plant that manufactured triple point ice and then went back to snow, dry snow?

A. Niagara Falls.

Mr. Miketta: Thank you very much. That will be all.

Redirect Examination.

Mr. Morris: Just two or three questions, Dr. Jones, please.

Q. I am not sure whether the term "filling pressure" has been used with two meanings or not. What would you say was the proper meaning that you have intended to give to filling pressure in your testimony? [456]

Mr. Miketta: May the court please, I would like to have counsel point to that page of the record where that was employed, so that at this time there is no further question as to what is meant or what was the context.

(Testimony of Charles L. Jones)

Mr. Morris: I have no reference to the record. What I had in mind was merely this: That the liquid that is being delivered to the apparatus is under a certain pressure. Now, whether the witness or counsel have used that or your Honor has understood it as being the filling pressure, I don't know. There is another meaning which was given to it only a few moments ago, which was the pressure in the apparatus at the moment of delivery. Whether those terms have been used to indicate one thing or the other may not be clear, and I wanted to see whether the record should be made clear with regard to that.

The Court: Well, I don't think there is any confusion.

Q. The initial pressure comes from the pressure in the container, does it not? A. Yes, sir.

Q. And that remains constant until it is released?

A. Yes.

Q. Or unless something happens to change the pressure back in the outlet pipe toward the container, but that is an unusual circumstance. When you referred to that pressure you were referring, were you not, to the pressure in the container? [457]

A. In the closed chamber of the press.

Q. That is right. A. Yes.

\* \* \* \* \*

Q. How long had you been experienced in the CO<sub>2</sub> art when you first saw the apparatus of Fig. 2 of the patent in suit? A. The CO<sub>2</sub> art, about six years.

Q. In the solidification of CO<sub>2</sub> art, CO<sub>2</sub> solidification?

A. The solid CO<sub>2</sub> art, less than one year.

Q. When you first saw this apparatus did you see how it could be operated? A. I did.

(Testimony of Charles L. Jones)

Q. And understood how it could be operated?

A. Yes.

Q. For making snow ice? A. Yes.

Q. For making triple point ice? A. Yes. [458]

\* \* \* \* \*

A. The question now, then, is: Do the presses, do the presses which I have seen and from which the drawings of Exhibit 7 were prepared have provision for controlling the inlets and the outlets. Yes; they do.

The Court: That is it exactly.

Q. By Mr. Morris: Dr. Jones, you were asked certain questions yesterday or the day before with regard to the Martin patent which was marked for identification. In one of the questions you referred to the next sentence as not having been included in the question. Will you tell me what lines of the patent to Martin, 1,659,434, were included in the question and the sentence to which you referred as not having been included by the learned counsel for defendants?

A. The question included page 3, lines 60 to 70; and continuing, I read from line 70. The patent says: "Hence, so long as only impalpably small quantities of the snow get through the screen, or are crystallized out in the upper space after the gas gets through the screen, such snow will be sufficiently taken care of by re-vaporization due to the heat which will leak through the insulation, 2, and the safety valve will function for satisfactory governing but, if the snow chamber overflows and ruptures the screen, the large amounts of snow released will clog the outlet to the safety valve, as well as the outlet 11. Experience shows that the piling up of pressure that then occurs, will blow [460] the top off of the tank before it will blow the passages free from the snow. Hence, the great advantage

(Testimony of Charles L. Jones)

of having the entire apparatus on scales whereby a run can be continued until the tank has been filled with snow to the maximum safe limit, with a certainty that filling beyond this limit will be indicated, regardless of the internal pressure."

Mr. Morris: If your Honor is clear on this question, I shall be glad to withdraw it. I just want to make certain that the ultimate distinctions between snow operation and the triple point operation are entirely clear of record.

Q. Dr. Jones, what can be your line for supply pressures upon the liquid in the pipes through which delivery of the liquid to the solidifying apparatus is had during a snow operation?

A. It may be any pressure from triple point up to 1500 pounds per square inch.

Q. At what pressures, if it is to be a snowing operation, must be maintained in the apparatus, pressing apparatus, solidifying apparatus?

A. Any pressure below the triple point.

Q. Is the liquid in the snowing operation charged into the apparatus as a liquid, or is that the operation in which a nozzle is sometimes used to produce a spray or vaporization at the time of the delivery of the liquid to the solidifying apparatus? [461]

A. There is no spray in the sense of liquid particles, that is, the operation to which you refer, the nozzle produces a spray-like discharge of solid particles.

Q. But there is no body of liquid supplied to the solidifying apparatus in the snowing operation?

A. No.

Q. There is a body of liquid supplied in the triple point operation?

A. Yes.

(Testimony of Charles L. Jones)

Q. The reason it can be supplied in the triple point is because the pressures in the apparatus are above the point at which the liquid delivered rapidly vaporizes?

A. Because they are above the point at which a liquid is possible.

Q. Above the point at which—

A. The point at which a liquid is possible.

Mr. Morris: That is all.

The Court: Any further questions?

Recross Examination.

Mr. Foster: Just a few, your Honor.

Q. Dr. Jones, when you referred to the time when you first saw a device like your exhibit Plaintiffs' Exhibit 7, in your answer to your questions from Mr. Morris, was that press in operation when you first saw it?

A. No; it was not.

Q. When did you first see it in operation? [462]

Mr. L. S. Lyon: If your Honor please, I don't think this is recross examination.

The Court: Yes; I think so. When did you first see it in actual operation?

A. During the early part of December, 1928.

Q. By Mr. Foster: And when with respect to that time did you first see the machine not in operation?

A. During December, 1938, and January, 1929, the patentees, Cole and McLaren, took me to the General Carbonic Company's plant and showed me the machine which had just been delivered, and was just ready for initial operation, of this form of vertical machine, and I co-operated with them and made numerous trips to the General Carbonic Company's plant, in the course of which we experimented with this machine; tried different nozzle



(Testimony of Charles L. Jones)

sizes; different arrangements of piping, and made tests to attempt to determine what the capacity of the machine was going to be, and what we could do with it.

Q. Prior to this occasion on which you first saw a machine like Plaintiffs' Exhibit 7, not in operation, Mr. Cole and Mr. McLaren had explained to you what they intended to do with the machine, that's true, isn't it?

A. No, I don't think that is quite right. We were familiar with the horizontal form of machine which had operated for some time, and Cole and McLaren explained that they had already developed a vertical design of the same general type of machine, and this vertical form was about to [463] be delivered. They said they believed, because of the larger block size, making four cubicle blocks instead of one, they could get more capacity out of the vertical form. However, the methods of the use of that apparatus, and some of the different applications of the device, were evolved among the three of us during discussions that took place in that period.

Q. And by various adaptations, you refer to various uses and adaptations you have described in your testimony for making blocks of different characteristics, is that true?

A. Yes, that is correct.

Q. Have you given the court now all of the substance of what Mr. Cole or Mr. McLaren told you with respect to this machine, prior to this date when you first saw a machine like Exhibit 7?

A. Frankly, I don't know.

Q. Have you given all the substance that you recall of what they told you?

A. They told me also about the subdivisions in the chamber which could be used to make four cubes without sawing. They discussed with me the control of pressure on the machine, and made the statement that their blower

(Testimony of Charles L. Jones)

system, which they used to control pressure on the horizontal machine, would work equally well on the vertical machine. That is about all.

Q. This horizontal machine to which you have just [464] referred, for making solid  $\text{CO}_2$ , did it make triple point  $\text{CO}_2$ ?

A. That machine was not, to my knowledge, ever so employed. We did, at a later time, have a horizontal machine of somewhat similar characteristics, known as the Goosman machine, in which we made the triple point form of solid at that time. However, I know of no previous manufacture of triple point solid in that machine.

Q. Was the horizontal machine, to which you have referred in your recent answers here, and with which you were familiar prior to the first occasion on which you saw a machine like your Exhibit 7,—was that horizontal machine adapted for the production of triple point ice?

A. I do not know.

Q. Was this discussion you have referred to, with Mr. Cole and Mr. McLaren, prior to the occasion when you first saw a machine like Plaintiffs' Exhibit 7, and in which you say various adaptations were worked out by the three of you?

A. That is correct.

Q. Did you suggest the adaptation or use of the machine for making triple point ice?

A. Yes, I did.

Q. Who was present when you suggested that?

A. I really don't recall.

Q. Mr. Cole was there, wasn't he?

A. No, when I first suggested that method of operation of that press—please read the question back. [465]

(Question read by the reporter.) A. Yes.

(Testimony of Charles L. Jones)

Q. Mr. McLaren was there, wasn't he?

A. I think probably.

Q. Who else was there, to the best of your recollection?

A. I am not certain, but I think that Mr. W. H. Fitzpatrick, of the Dry Ice Corporation, was present at the same time.

Q. Who else?                      A. No one else.

Q. Where did this conversation take place?

A. In the Long Island City plant of the General Carbonic Company.

Q. Can you fix the date for us, please?

A. I cannot exactly. It was during December, 1928.

Q. Will you tell the court exactly what was said with respect to the making of triple point ice, in that conversation?

Mr. L. S. Lyon: If your Honor please, I would like to renew my objection. This is not recross examination. It seems to be far afield of the direct examination.

The Court: This is not a renewal of your objection. I think it is an entirely different one. Objection sustained.

Q. By Mr. Foster: You read, Dr. Jones, on your direct examination a passage from the patent of Martin. Was that passage which you read a true statement with respect to the [466] operations you observed of the Martin snow press?                      A. My answer would be, only hearsay.

Q. Then I don't care for your answer. Your answer is, you don't know from your own observation?

A. My answer is no snow tank was ever exploded under my supervision in a plant of the Dry Ice Corporation.

Mr. Foster: Nothing further.

Mr. Morris: That is all. [467]

HARRY W. COLE,

a witness called by and on behalf of the plaintiffs, having been first duly sworn, testified as follows:

The Clerk: State your name, please.

A. Harry W. Cole.

Direct Examination.

Q. By Mr. Morris: Mr. Cole, will you give us your full name and address?

A. Harry W. Cole, New Rochelle, New York.

Q. You are the Harry W. Cole mentioned in the patent in suit?

A. I am.

Q. Mr. Cole, will you be good enough to tell us whether you are a graduate of any college or university, and if so, what?

A. I hold a bachelor of science degree from Amherst College, Amherst, Massachusetts.

Q. What year, Mr. Cole?

A. Class of 1915.

Q. What were your occupations from 1915, generally speaking, until, we will say, 1928? I am interested only in those which have a bearing upon the CO<sub>2</sub> industry.

A. I had had some experience before that, in 1908 and 1909, in the natural CO<sub>2</sub> field in Saratoga Springs, New York, where they were at that time recovering gas from mineral water wells, compressing it for liquid CO<sub>2</sub>. On December 1, [468] 1915, I was employed by the General Carbonic Company at their Buffalo, New York, plant. I remained there until May, 1924. When I left there I was manager of the Buffalo plant. In 1924 I was made manager of plants for the General Carbonic Company, and I held that position with the General until February 1, 1928. I was then employed by the Liquid Carbonic Company as district superintendent of gas plants, eastern divi-

(Testimony of Harry W. Cole)

sion, until December, 1930, when my employment with them was terminated, and since then I have not been directly connected with the production field of either liquid or solid carbon dioxide.

Q. Will you be good enough to tell me when you and Mr. McLaren first conceived of the vertical machine of Fig. 5 of the patent in suit?

A. That was conceived by us during the latter part of the summer of 1925.

Q. Was that before or after your conception of the machine of Fig. 2 of the patent in suit?

A. We thought of the vertical type machine first, and as the outgrowth of our discussions with respect to it, and the problems in connection with it, we developed a horizontal type of machine.

Q. With which of the machines did you make your experiments, if any?      A. With the horizontal type.

Q. Did you find any problems to be solved with that [469] machine?

A. Yes, there were many problems.

Q. What were some of those problems and their solution, Mr. Cole? To be more specific, did you find any difficulty or problems with respect to the delivery of the CO<sub>2</sub> in liquid state to the vaporizing chamber in the apparatus illustrated in Fig. 2?

\* \* \* \* \*

Q. By Mr. Morris: The question is, what difficulties or problems confronted you in your experiments of the apparatus of Fig. 2 of the patent in suit?

A. The problems that confronted us were those which were imposed by the various characteristics of carbon dioxide, which weren't entirely known to us, although, as



(Testimony of Harry W. Cole)

the machine was originally constructed, there was first a spiral member in there, which was intended to assist in the delivery of [470] solid  $\text{CO}_2$  which might be carried up into the expansion chamber, and back down into the compression chamber. That didn't work, and the first thing that we tried was a cutter in there.

Q. My first question is limited to the delivery of  $\text{CO}_2$  to the vaporizing chamber or solidifying chamber of Fig. 2 of the apparatus; if you will just confine your answer to whether you found any difficulties in delivering  $\text{CO}_2$  in liquid form to the vaporizing chamber, then I will go to the next question. [471]

A. As that first machine was designed, and attempted to be run, it had a spirally wound coil in the compartment between the outside jacket and the inner expansion chamber, the purpose of which was to refrigerate that coil by the expanded gases and the return going to the return conduit. We were never able to produce any solid in that machine for the reason that the repeated expansion of the carbon dioxide in the machine resulted in the crystallization or solidification of the carbon dioxide in the coil itself, so it would soon block itself off.

Q. Was the coil to which you refer the coil in which the incoming liquid  $\text{CO}_2$  was being supplied?

A. Yes.

Q. What effect, Mr. Cole, did the crystallization of some of the  $\text{CO}_2$  in the delivery pipe have upon your ability to get a discharge of that into the vaporization or solidification chamber of the apparatus of Fig. 2?

A. We couldn't get it in.

(Testimony of Harry W. Cole)

Q. How did you solve that problem?

A. The coil was removed, and the liquid inlet line was directly connected with the nozzles at the lower end of the chamber.

Q. Was that the end of your difficulties, or did you find new difficulties?

A. We ran into new difficulties in the handling of the solid product after we were able to get a solid product [472] produced in the machine itself.

Q. After you were able to get the delivery of CO<sub>2</sub> to the apparatus of Fig. 2, were you able, immediately thereafter, to get CO<sub>2</sub> solid in the apparatus?

A. We got solid, but we didn't get the finished product; that is, the compacted solid, because, as soon as the solid was produced in there that developed other problems.

Q. What became of the solid that was then produced in the upper chamber of the apparatus of Fig. 2? Where was it deposited?

Mr. Foster: I wish to object to this question, and this line of questions, on the ground of indefiniteness as to time.

The Court: I think it was during the process of this study. It didn't last more than two or three months, did it?

A. I would say it carried on, the actual experimental work with the machine went on from about the 1st of November, 1926, until probably April or May of 1927.

Mr. Morris: You may proceed to answer the other question.

A. May I have the question again please?

(Question read by the reporter.)

A. With the attempted operation of the spiral member it became— [473]

(Testimony of Harry W. Cole)

The Court: I think that was Mr. Foster's point; was it before you took that spiral member out or afterward? His objection is directed to that.

Q. By Mr. Morris: Initially there was a spiral member between the solidifying chamber and the pressing chamber, was there not, Mr. Cole, of your apparatus of Fig. 2? A. No, the spiral member—

Q. I am sorry. I used spiral member when I meant spider.

A. Yes, there was a cross member or spider at the bottom of the shaft. It was a bearing point.

Q. The function of it was what?

A. It was a bearing point for the lower end of the shaft.

Q. In the solidifying chamber, what apparatus was there initially?

A. Initially there was a screw spiral, which was rotated with the idea of pushing the snow down through the bottom of the chamber and delivering it to the compression chamber.

Q. What were the consequences of your using the rotating spiral member in the upper chamber of the apparatus of Fig. 2 of the patent, while the spider remained between the upper and the lower chambers of your apparatus?

A. The spiral member did not do a good job of delivering [474] ing the solidified CO<sub>2</sub> at the bottom. The snow would feed in the neck or throat, between the upper and lower chambers, and tend to close that off, and the spiral member merely made it worse, and would choke off in there, and we couldn't get it down into the lower chamber for pressing purposes.

(Testimony of Harry W. Cole)

Q. What did you do to try to get it down, Mr. Cole?

A. We tried all kinds of bars, of course; one thing and another, to dislodge it. That was unsatisfactory. The spider or cross member at the bottom was removed. Eventually the spiral was removed too. I don't recall now which took place first. We substituted other means of trying to accomplish our objective.

Q. While the spider and spiral remained in, were you, or not, able to make the apparatus of Fig. 2 of the patent in suit operate to produce blocks of snow as it had been intended?

A. No, it would not produce; that is,—I talked too fast; I mean we did produce snow in there, but we were unable to get it out in the condition in which the machine was intended to produce it.

Q. You produced snow in there,—meaning where, in the upper chamber, the lower chamber, or both?

A. There was some produced in the lower chamber, but the connecting member is what clogged off.

Q. If the snow was produced in the apparatus, and some of it went to the lower chamber, what prevented you, [475] Mr. Cole, from pressing that snow into blocks?

A. We were never able to get enough in there to even cool the machine down to the point where we would have a solid at the end of the compression stroke, without using some ultimate means to get the product down.

Q. To remedy these difficulties what did you and Mr. McLaren do?

A. We tried various schemes. We used a cutter on the shaft to replace the spiral member.

Q. What was the form of that cutter, Mr. Cole?

A. As I recall it, it conformed fairly well to the shape of the upper or expansion chamber.

(Testimony of Harry W. Cole)

Q. You used that with what result?

A. It bent and broke several times, and ultimately, when we made one that was rigid enough to stand the gaff, it bent the shaft at the bottom, because it was taking the thrust entirely on one side, and eventually broke the shaft. So, following that, we tried a counter-balanced shaft with two blades, one on each side. That worked better, but we still had some trouble with it. We tried at one time to put propellers on there, a series of them, one above the other, of different sizes.

Q. What did you eventually use in the upper chamber of the apparatus of Fig. 2?

A. Ultimately we changed the design of the upper chamber. We did a lot of experimenting, along in December [476] and January, 1926 and 1927, and we built different models of snow chambers. They were constructed of metal; something with a handle on the top, that we turned, and got different kinds of cutting devices to operate it. It was a sort of glorified and oversized coffee grinding arrangement. We would produce carbon dioxide snow, packed in there in different forms, and try to dislodge it. Out of that series of experiments we concluded that what we should have was an upper tank that was, if anything, larger at the bottom than it was at the top, so that the tendency was that it would clear itself much more easily, and that the shape of it should be elliptical, with two cutters on two separate shafts in there, disposed at 90 degrees angle, so we could shear; [477] then, as the snow would build up on the sides it would shear it off and drop it down in the form of fairly small pieces, so it would distribute itself well in the bottom chamber for pressing.



(Testimony of Harry W. Cole)

Q. Did you tell me that the shaft for operating the cutters was broken at some time during your experiments or not? A. Yes; we have had several shafts broken.

Q. After that what did you do; did you operate without a cutter or the scraper?

A. Yes. Yes; we did. In fact, we got quite some production out of the machine before we finally worked out the better type of cutters to clear the upper chamber. We used to use a bent bar, and by retracting the opening head we could go up there and poke in and loosen it up. We also had the top of the shaft where it was brought out, we had a plate made with a couple of bolts to hold that in as a plug in the top so the stuff would not blow out of the top of the chamber, and by removing that we used to get a long slice bar and go down and slice it off on the sides. We could keep pretty clear. It was not a workmanship job and it would not work the way we intended it to, but as long as you kept active enough, we could keep the stuff coming through.

Q. Then were you able to get delivered into the pressing chamber a sufficient amount of CO<sub>2</sub> to make a block of the size desired? [478]

A. Oh, yes; we did. In the beginning we had some trouble there, when we were fooling around with the different cutters, getting enough down there to do it, and we had to open up that head and poke in there to get the stuff down. So many times we would scoop it out and pile it up on the floor until we had enough, and then throw it back in and compress it.

(Testimony of Harry W. Cole)

Q. Did you have any compressed gases at any time in the blocks so formed during your experiments with apparatus of the form of Fig. 2 of the patent in suit?

A. Yes; we have had the blocks come out of there and blow up in our face. We had one explosion there when the fellow was distributing the payrolls and we picked up dimes and pennies off from the structural steel on the top of the building for weeks. After that—

Mr. Foster: I am late with my objection, your Honor, but I didn't want to interrupt the witness. I object to the question and move to strike it and the answer on the ground it is indefinite as to time.

Mr. Morris: It was during the time—

The Court: Make it definite as to the time when this happened.

Q. By Mr. Morris: Will you fix the time?

A. Well, I can't fix it specifically. I would say it was during that period between November of '26 and May of '27.

The Court: We will take our morning recess at this time. [479]

A. That is 18 or 19 years ago. It is a little bit hard to fix some of these *parts*.

The Court: I think that is sufficiently definite for counsel.

(Short recess.)

The Court: Proceed.

Q. By Mr. Morris: What did you find was necessary in order to prevent compressing and imprisoning CO<sub>2</sub> gas

(Testimony of Harry W. Cole)

in the blocks of ice or snow pressed in your pressing chamber?

A. Well, we found that we had to get the pressure off the snow before we could compress it and make a stable block of it.

Q. And how did you accomplish that?

A. Well, we had had considerable difficulty, and one of our difficulties was this: That the entrained particles of snow would carry back into the blow-back line and they used to plug it up. And then we developed a pressure through all of the system from the point where it plugged up, and in order to overcome that, we decided to operate while solidifying, carrying a pressure in the solidifying chamber, the theory being that by adding to the pressure above atmosphere that we would decrease the volume of the gas being carried out, and we would get a corresponding reduction in the velocity of the gas leaving the chamber and we would reduce the amount of entrainment. We put in equipment to bring about that desired result. We found that we could operate [480] at about 20 pounds or 30 pounds back-pressure in there, and we very definitely reduced the amount of entrainment; and also, we ran into another difficulty and that was that we ran into the same difficulty there that we did when our blow-back line plugged up, that is, we were compressing our blocks under that 20 or 30 pounds pressure and they just were unstable.

Q. What do you mean by "unstable"?

A. Well, I mean you take them out and they would blow up, they would break apart, they would just disintegrate. There were gas pockets formed in there. Unless we held the pressure on them for a very long time and reduced the external pressure on them as soon as they

(Testimony of Harry W. Cole)

came out of the machine, they just would not stay a block any longer.

Q. When did you charge liquid into the solidifying chamber of apparatus No. 2 with respect to your pressing operations?

A. Well, as it was originally designed, we thought we had a machine there that could be continuously operated so that we could continue the solidification during the pressing period, and as long as we had no pressure, that is, negative pressure in the upper chamber, we could do that; but as soon as we began to operate with the pressure in the upper chamber, then we found that we had something in the lower chamber that we did not want. The result was that we had to lose the advantage of it as a continuous operation and solidify as a [481] part of the cycle and at a pre-determined and constant pressure. Then we had to stop our solidification and reduce the pressure on there at the time when we were pressing the blocks. I mean it was a vicious cycle; what was good for one was not good for the other and we could not get both conditions in there at the same time.

Q. By The Court: I suppose "negative pressure" is like some of our Latin phrases, just a fancy word for suction?

A. Well, I really didn't mean that. I meant at approximate atmosphere. Negative pressure really does mean a vacuum, and that is not what I meant. I meant an absence of pressure.

The Court: An absence of pressure.

Q. By Mr. Morris: Through what ranges of pressure did you experiment during the period in question?

A. We operated all the way from zero pressure up to 30 pounds.

(Testimony of Harry W. Cole)

Q. Zero gauge? A. Zero gauge to 30 pounds.

Q. Up to 30 pounds. Did you eventually succeed in making the apparatus operate?

A. Yes. As an intermittent operating machine, it worked and produced very good blocks. We discovered this: That in playing with those pressures—we didn't know why at the time, but we did find this—that as we raised the pressure, we found that the product that was produced and that we were [482] able to press made a much nicer block, much better texture, had better structural strength, and less tendency for it to have a soft top.

Q. By The Court: That is, as you raised the pressure during the formation?

A. During the formation. I have been told since why that was, but at the time when we did it we didn't recognize it.

Q. By Mr. Morris: Mr. Cole, this was carried on during the time you were where, employed where?

A. I was employed at the time by the General Carbonic Company, Long Island City.

Q. Is that the company to which Dr. Jones referred in his testimony as the other plant producing carbonic or CO<sub>2</sub> ice or solid?

A. No. I think he referred to the Carbice Corporation in this connection, and the Carbice Company or Corporation was merely a customer of General Carbonic Company.

Q. Very good. Were any solidification operations of CO<sub>2</sub> carried on in the plant of the General Carbonic while you were there?

A. Do you mean other than the one I have just mentioned?



(Testimony of Harry W. Cole)

Q. Other than the one you have mentioned.

A. Yes. Dry Ice Company came in there as a customer in May, 1925 and they remained there until late in September of 1926. [483]

Q. Mr. Cole, what was the business of General Carbonic other than the operation, customer operation to which you have referred? What did they do? What did they make?

A. Well, their main product was the production and liquefaction of carbon dioxide for use in beverage, refrigeration and other commercial trades.

Q. You say "main product". Did they have any other product?

A. Yes. We were manufacturing fire extinguishers, Fire-Freeze fire extinguishers. We used to make headers and equipment for the use in connection with the carbonation of beverages.

Q. What apparatus did Dry Ice Company have in your plant for making solid CO<sub>2</sub>?

A. When they first came in there, for a matter of a few days the product was made in burlap bags, the same as you saw it made here in the courtroom a few days ago.

Q. By The Court: They just came there to use the source of supply?

A. That is it exactly. And that was put into molds, it was hand-tamped, and then pressed in a little hand-operated press. That was only a matter of a few days until their snow tanks came and they were installed and operated during the entire period of their stay with the General Carbonic Company.

(Testimony of Harry W. Cole)

Q. By Mr. Morris: Wherein, if at all, did the snow tanks [484] operated by the Dry Ice Company during that period differ from the snow tanks described by Dr. Jones as being in the plants of the Dry Ice Company?

A. They were precisely the same snow tanks; and I think Dr. Jones has adequately described their construction and their operation.

Q. By The Court: To complete the record, have you been in the courtroom during the entire progress of this trial?

A. Yes; I have.

Q. You have heard all of Dr. Jones' testimony?

A. I have heard all of it; yes.

Q. By Mr. Morris: How did you come to consider making an apparatus of the kind illustrated in Fig. 5 or 2,—and 2 of your patent in suit?

A. Well, it was merely this: That we felt that, with the losses being incurred in the production of solid as it was then being made, it was an uneconomic method; that the industry never could grow to any definite size. We didn't think that the Dry Ice Company would ultimately succeed. We didn't think any manufacturer of liquid could support such an industry. The amount produced, as I remember—at the time, there was some altercation with regard to the bills, because there were times that the production of ice as against the amount of liquid gas supplied to the Dry Ice Company was on the basis of about 1 to 3. In other words, we were producing in that plant around 1100 pounds an hour of [485] liquid and that is what we would deliver into cylinders when we were filling cylinders, and when the Dry Ice was on the line, why, the production was pretty uniformly around 300 pounds an hour; and I don't think at any time when they were

(Testimony of Harry W. Cole)

there did they ever get to the point when the actual ice produced as against the amount of liquid sold to them amounted to more than 40 percent of the amount of liquid. And it was our feeling that something could be worked out that would be more economic. Even as they went along in the summer of 1925, I have seen the hand-tamped and pressed blocks, as pressed in the atmosphere, that would not be stable; that would blow up. In other words, they had to be careful and not try to compact them too much; there were limits there to which they could compact them.

Q. Were you familiar, Mr. Cole, with the sublimation losses from the time the manhole in the tank, the snow tank, was opened until the snow had been compressed into a block? A. Yes.

Q. By The Court: Who was McLaren? The record does not show that. You say "we" and apparently you mean you and Mr. McLaren?

A. That is right. Mr. McLaren at that time was the superintendent of the Long Island City plant of the General Carbonic Company.

Q. You were working, however, where?

A. Well, my work was all over. I was manager of plants [486] and had nine plants, of which the Long Island plant was one.

Q. Yes. And when you were conducting these experiments where were you working?

A. The experiments were conducted at Long Island City. Is that—

Q. Yes; that is what I thought. They were done at Long Island City and Mr. McLaren was there?

A. Mr. McLaren was there all the time, but I circulated among the eight or nine different plants that we had

(Testimony of Harry W. Cole)

at that time, although New York was my headquarters and the bulk of my time was spent there at Long Island.

The Court: Yes.

Q. By Mr. Morris: You were familiar with the tamping operation?      A. Yes, sir.

Q. In the snow tank operation?      A. Yes, sir.

Q. Who was in charge of that dry ice operation, solidification operation in the plant of General Carbonic?

A. Who was in charge of the dry ice operation, you say?

Q. In the dry ice or the solidification operation in the plant of the General Carbonic.

A. My friend, Mr. Martin, and, I believe, Mr. Hood was his superintendent at that time.

Q. What use, if any, were you able to make in connection with the apparatus of Fig. 5 of the patent in suit of your [487] experiments with the apparatus of Fig. 2 that resulted in Fig. 2 of the patent in suit?

The Witness: Will you read the last part of that question?

The Court: I do not believe that question is clear. Will you reframe it, please?

Mr. Morris: May I withdraw it and simplify it?

Q. When you first conceived of the apparatus of Fig. 5 of the patent in suit did you know at all that satisfactory blocks of ice could be produced therein without tamping?

A. No; we did not.

Q. Did you have any screen in the apparatus of Fig. 5 of the patent in suit?

A. No; there was no screen. We had a substitute for a screen.

(Testimony of Harry W. Cole)

Q. That substitute was what?

A. We had a series of holes or apertures which were around the upper perimeter of the upper chamber, our theory being that, with the snow tank and with the screen across the top and the velocity of the gas going up through there, had a tendency to smaller particles, would pack on that screen until it would plug it off; and we felt that in this particular design, that by putting the outlet for the gas on the side we would change the direction in which the gas would be going out, the entrained particles would impinge against the upper platen in their and either have a tendency [488] to stick or to drop down rather than to be carried around the turn and through these small openings.

Q. Small openings, how large were they, Mr. Cole?

A. Well, my recollection is those holes were probably maybe three-quarters of an inch in diameter. That is pretty hazy in my mind now.

Q. Very well. Then, did they function as a screen or function to divide the outflow currents?

A. Well, they didn't function as a screen. They were intended as a substitution for the screen, to allow the escape of the unsolidified gas without carrying as much of the entrained gas away.

Q. Very well. A. I am merely—

The Court: What Mr. Morris means is: Were they designed to accomplish the same result as the screen, in a different way?

A. Yes; they were intended to accomplish the same result and, at the same time, be an improvement over the screen.

Q. What you were doing, you were using currents, changing the direction of flow so as to permit of it impinging on the shell? A. That is right.



(Testimony of Harry W. Cole)

Q. Of these particles, and let the gases pass out?

A. That is right; and providing a chamber in there for the collection of what did go over so they wouldn't get into [489] the blow-back line and plug it up.

Q. And then, how did you do that? That is what I was wondering.

A. Well, this was a double-jacketed chamber with the outlets fairly close to the bottom, where the gas escaped from the outer shell. One of the things, one of our mental hazards, we didn't know whether it would work or whether it would not.

Q. By Mr. Morris: And it did?

A. Well, it did ultimately. When we first built that machine, that was in 1928, we had been through the bulk of our experiments with the horizontal type of machine and had a knowledge at that period that we did not have in 1926 when we first started to play with the horizontal machine.

Q. Did you know when you first conceived of this machine whether it could be safely operated or not?

A. No. I will tell you very frankly we had misgivings with respect to it. The state of the industry at that time—

Q. We are speaking solely of Fig. 5, are we, Mr. Cole?

A. I understood your question was directed at that.

Q. That is correct.

A. Back at 1926 and for a period there, the Interstate Commerce Commission regulation would not allow handling more than 50 pounds of liquefied gas in a single container and ship it, with the exception of a few that were used in the lighthouse service for government purposes. In the lique- [490] faction plants we kept our

(Testimony of Harry W. Cole)

liquid receivers, as much as we could, down to the point where there was not more than 50 or 100 pounds of liquid in any one container. We did that as a measure of safety, because of the fact that if you double the quantity of liquid and something blows, why, your disaster will be twice as great, and with the machine such as we had conceived of, the vertical type machine, we would be running into big volumes there.

Q. How much liquid would be required to charge to make a 20x20x10-inch block, on the average?

A. Well, the amount of liquid utilized in producing a 200 block solid CO<sub>2</sub> will be in the neighborhood, probably, of 500 pounds, depending on the efficiency.

Q. That is, with the single pass, as Dr. Jones referred to, you have to put through 500 pounds, approximately 500 pounds to get a 200 block of ice or snow?

A. Yes.

The Court: I don't think you have answered Mr. Morris' question. The Interstate Commerce Commission regulation as to shipment and the size of the storage tank in which you kept it, whatever you might call it, was not the thing. What he asked you was with regard to the machine itself. Did you have misgivings with regard to what was going to happen during these theoretic operations?

A. We did. We had misgivings, and I just threw that in there to indicate where the mental hazard came from as to— [491]

Q. That you were monkeying with a dangerous product? A. That is right.

(Testimony of Harry W. Cole)

Q. By Mr. Morris: Did you know, of your own knowledge, of any explosions of snow tanks or not?

A. No; I never knew of any that ever exploded. I have seen the blow-back lines get plugged up so that they have leaked at the gasket, so that the operator has considered it essential to loosen the holding mechanism on that door enough to allow some escapement to relieve it. [492]

\* \* \* \* \*

Mr. Foster: I think Dr. Jones has testified that there were commercially-operated devices like his charts, Exhibit 7.

The Court: That is what I am referring to.

Mr. Foster: Yes. And I think that I would be willing to stipulate on behalf of my defendant that that is true.

Mr. Morris: That what is true?

Mr. Foster: What I have just stated.

Mr. Morris: Will you read the statement of Mr. Foster, [493] please?

(Statement read by the reporter.)

The Court: May that be stipulated?

Mr. Foster: Yes, sir.

Mr. Miketta: I concur in that stipulation, if I may, your Honor.

The Court: Very well. [494]

Q. By Mr. Morris: You are an officer and director of the International Carbonic Engineering Company, one of the plaintiffs in this suit?

A. The Engineering Company?

Q. The Engineering Company. A. Yes.

Q. You have been such director for how long?

A. I have been a director of the Engineering Company since, I think, about 1932. I have been vice-president of

(Testimony of Harry W. Cole)

the Engineering Company,—one of the vice-presidents, since about two months back.

Q. The patent application in suit was transferred by you and Mr. McLaren to Carbonic Equipment Corporation, or Company, whichever it was, was it not?

A. That's right.

Q. And then that company sold that patent, or patent application, to the International Carbonic Engineering Company; is that correct?

A. To the Carbonic Equipment Corporation. It was acquired by a purchase of stock by the Engineering Company.

Q. My question was whether the Carbonic Equipment Corporation did not assign the patent application to the International Carbonic Engineering Company.

A. They did assign it, yes.

Q. Were you familiar with the licenses of the patent in suit? [495] A. Yes, sir.

Q. I hand you this paper, and ask you what it is.

A. Just a minute. He hasn't qualified me as yet as an officer of the International Carbonic, Inc. Shouldn't that be done by the plaintiffs?

Mr. Miketta: Pardon me, your Honor. May I look at the document?

Q. By Mr. Morris: Mr. Lyon reminds me that I have not asked you if you are an officer, other than a director, of the plaintiff, International Carbonic Engineering Company.

A. Yes, I have been a director of International Carbonic Engineering Company, Inc., and its predecessor corporation, bearing the same name, since early in 1936, and I have been a vice-president of International Carbonic, Inc., since about August of 1936.

(Testimony of Harry W. Cole)

Q. And vice-president of International Carbonic Engineering, how long? A. Only two months.

[496]

\* \* \* \* \*

Q. Mr. Cole, do you as an officer of the plaintiff companies know whether or not they have licensees?

A. Yes; I do.

Q. Can you name those licensees?

A. I believe I can.

Q. Will you?

A. There is the Mathieson Alkali Company, the Michigan Alkali Company—I think that name may have changed to Wyandotte Chemical Company recently, the Liquid Carbonic Corporation, Pure Carbonic, Incorporated, the Pittsburgh Plate Glass Company, the Wabash Portland Cement Company, and Carribean Carbonic Company.

Q. Corporation? A. I am not certain.

Q. Mathieson is sometimes referred to as Mathieson Alkali Works, Inc.?

A. I believe so. I may not have used just the correct terminology there.

Q. Have you been in the plant of the Michigan Alkali Company and do you know what apparatus is used by it?

A. Yes, sir.

Q. Will you describe the apparatus that is used by that company? [517] A. They are using—

The Court: You can describe it by reference, if you want to.

Q. By Mr. Morris: Does it correspond with Fig. 5 of the patent in suit.

A. I would say so; yes, sir. [518]



(Testimony of Harry W. Cole)

\* \* \* \* \*

Q. By the Court: Is this Fig. 5 an approximate description of the machines that you saw in the Wyandotte, Michigan plant of the Alkali Company?

A. I think I answered that, your Honor.

The Court: All right. Go ahead.

Q. By Mr. Morris: Have you been in plants of other [519] licensees? A. Yes.

Q. What was the type of CO<sub>2</sub> solidifying and pressing apparatus used in those plants?

A. They were all of the same type.

Q. Corresponding to Fig. 5 of the patent in suit?

A. All correspond with Fig. 5.

Q. Do you know the type of machine that the Pittsburgh Plate Glass Company has?

A. Yes. I know that from the company records. I know that that press was manufactured by the Baldwin-Southworth Company, and that information has come to me from my contacts with the licensee and the Baldwin firm who—the Worthington Pump Machinery Company who collaborated with them in the building of that plant.

Q. But the information has come to you as an officer of the company? A. Yes.

Q. Of the plaintiff companies? A. Yes, sir.

Q. What type of machine is being used by the Pittsburgh Plate Glass Company?

Mr. Foster: Objected to as calling for hearsay.

Mr. Morris: I submit that it is not hearsay. It is report made by the company and by his information received at the time the machine was being built. He tells

(Testimony of Harry W. Cole)

you the type [520] of machine it is. It was made by Baldwin.

Q. Does that give you enough information to enable you to know the type of machine being used by the Pittsburgh Plate Glass Company?

A. It does, because they have only made one type of press. The only change that they have made since the original design which was drawn from blueprints that were furnished to them prior to the time that we applied for the patent, there have been minor changes in hydraulic arrangement and a slight variation in the walls of the press chamber.

Q. Is the machine so used by Pittsburgh Plate Glass Company of the type of Fig. 5 of the patent in suit?

A. Yes, sir.

Q. How many machines operated by Pittsburgh Plate Glass? A. One.

Q. The Wabash Portland Cement Company apparatus, how many machines? A. They have one.

Q. Have you information with respect to that or have you seen it?

A. No; I have not seen it, but that—

Q. As an officer of the company and the information that you have received as an officer of the plaintiff companies, do you know the make of that machine and its type?

A. Yes. It was manufactured by the Baldwin Company for them. [521]

Q. And the type corresponds with Fig. 5 of the patent in suit? A. Yes, sir.

Mr. Foster: Objected to as calling for hearsay, no foundation laid.

(Testimony of Harry W. Cole)

The Court: Well, I think it does that way.

Q. You know that the Baldwin people sold them one machine and they only have one, do you?

A. That is right.[522]

\* \* \* \* \*

Q. By Mr. Morris: Have you been in any of the Mathieson plants?

A. No; I haven't been in the Mathieson plants.

Q. Take Liquid, have you been in several of those plants? A. Yes; I have.

Q. Can you tell me which plants of Liquid that you have visited? A. Yes, sir.

Q. Will you?

A. Long Island plants, located at Long Island City; Boston, Massachusetts, Buffalo, New York; Chicago, Illinois; Pittsburgh, Pennsylvania; Philadelphia, Pennsylvania; Seattle, Washington; San Francisco, California; Los Angeles, California; Albany, New York.

The Court: Chicago?

A. Yes; Chicago, Illinois. I thought I mentioned that.

The Court: I guess maybe you did. I was not sure. Long Island City?

A. Long Island City, that is the first one I mentioned.

The Court: Yes.

Q. By Mr. Morris: Did you see the apparatus of the carbon [524] dioxide solidifying and press apparatus used by your licensee, Liquid, in those several plants?

A. Yes, sir; I have.

Q. Will you tell me whether the apparatus that you saw in those several plants had the elements as shown by

(Testimony of Harry W. Cole)

Fig. 5 of the patent in suit and were adapted and were used as shown in Plaintiffs' Exhibit 7 in this case?

Mr. Foster: That is objected to as a compound question, presuming facts not in evidence, presuming that the operation of Fig. 5 and Exhibit 7 are the same.

The Court: Read it, please.

(Question read by the reporter.)

The Court: Objection overruled. I understand you are entirely familiar with 7 and you were here during the testimony?

A. Yes. Of course, 7 has a lot of optional bases of operation, and my answer to that would not necessarily refer to any specific—

Q. By Mr. Morris: I show you a copy of Fig. 7 and ask you—

A. I have it right in front of me here. I have the Fig. 7 here.

The Court: Well, eliminating the order of optional bases, were they operated in that manner?

A. Yes. You see, these different plants have different operating conditions, maybe, from the solidification equipment itself. Some have low-pressure sources, some don't, [525] and there are various way of handling it, all of which I think Dr. Jones has covered in his various ways, as he has illustrated in reference to this Exhibit 7 in here. But I mean all of those ways would not be used in any one operation. I just want to be sure that I am understood in answering it.

Q. By Mr. Morris: I withdraw the question, and ask you as to whether those machines that you saw or the apparatus that you saw in the several plants of Liquid

(Testimony of Harry W. Cole)

Carbonic Company that you have mentioned had the elements shown in Fig. 5 of the patent in suit?

A. Yes.

Q. How did those several machines function in operation; did they operate, all or some of them, in conformity with the operation shown in the first nine figures of Plaintiffs' Exhibit 7 in this case?

A. Yes; they would correspond to—I think I had better refer to that now. I will have to qualify that answer if I make it, for the reason that I explained a minute ago. These references refer to, in the handling of the exhaust gases from the solidification chamber, high-pressure and low-pressure sources. There have been various methods developed for handling that, and not always the same; and I mean I can't say that there was always a high-pressure and a low-pressure source to these. There either was that or there was some instrumentality in there which gave the effect of a high-pressure and a low-pressure condition in the system. [526] Now, I just don't want to be caught up on how literally this Exhibit 7 is being interpreted.

Q. All right; let us come to that. You are familiar with Fig. 1 of the patent in suit? A. Yes.

Q. Does or does not that show apparatus for operating the machine or structure at high pressure and low pressure? A. Yes; it shows both.

Q. Do the structures which you referred to as having seen in the plants of Liquid have apparatus to enable those structures to operate at certain stages of the cycle at high pressure and others at low pressure?

A. That is right; they do.

Mr. Miketta: Objected to, your Honor, as being highly indefinite. Are you referring to the pressure



(Testimony of Harry W. Cole)

within the chamber at a given period? I don't know whether the witness understands it, but I do not.

The Court: Will you read the question?

(Question read by the reporter.)

The Court: You mean at times at low pressures, or other stages of the cycle at low pressures?

Mr. Morris: That is right.

The Court: You may answer.

Mr. Foster: Objected to, if the court please, on the further ground it is indefinite in the use of the terms "high and low pressures." [527]

The Court: Oh, well, I think that is a matter of common knowledge. You may bring that out on cross examination. I don't think there will be any confusion there. You may answer.

A. The answer is "Yes."

Q. By Mr. Morris: Have you seen any plants of your licensees other than those which you have now testified to? Have you visited or seen the apparatus in any other plants of any of your licensees?

A. Have we referred to Michigan Alkali Company's plant?

The Court: Wyandotte. A. The Wyandotte.

Q. By Mr. Morris: You said you had been in that, as I recall it? A. Yes.

The Court: You testified you saw those and those were Fig. 5 or like it? A. Yes.

Q. By Mr. Morris: You did testify as to that?

A. No; that covers all of the plants that I have personally been in, to the best of my memory at the moment.

(Testimony of Harry W. Cole)

Q. To clear it up about Michigan, my recollection is that you did testify that you had gone in and inspected the apparatus in the Michigan plant at Wyandotte?

A. Yes. If I did not testify to it, I will do so now. I have been in the plant and inspected the original records [528] showing the purchase orders, where they were originally purchased, and I have here a list of the dates that were taken off of that as to when they were purchased.

Q. Did those structures that you saw in the Michigan plant have the elements and function as does the apparatus of Fig. 5 of the patent in suit?

A. Yes.

Mr. Morris: That closes, if your Honor please, my desire to enter proof upon that. Now, other than "Inc." as a plaintiff, I want to show its relationship to Engineering Company and also that it is the licensing agent or exclusive licensee of Engineering Company.

Q. Do you know who owns the capital stock of the plaintiff International Carbonic, Inc.?

A. Yes. [529]

Q. By whom was it owned?

A. It was owned by Carbonic Engineering Company.

Q. All of it? A. 100 per cent.

Q. Incidentally, do you, directly or indirectly, own any capital stock in International Carbonic Engineering Company?

A. Directly, no.

Q. Do you or your family own any of the capital stock of another company which owns some of it?

A. Part of it.

Q. The name of that other company is what?

A. Metropolitan Carbonic.

(Testimony of Harry W. Cole)

Q. That is, own what percentage of the capital stock of the International Carbonic Engineering Company?

A. 25 per cent of the common stock. [530]

\*      \*      \*      \*      \*      \*      \*      \*

### Cross-Examination

Q. By Mr. Foster: Mr. Cole, you mentioned that you or your family owned some interest in the Metropolitan Carbonic Company?      A. That's right.

Q. How much interest?      A. About 30 percent.

Q. That company owns 25 percent of the common stock of which one of the plaintiffs?

A. International Carbonic Engineering Company, the parent corporation.

Q. Do you own any of the stock, or does your family, of the other plaintiff, International Carbonic, Inc.?

A. I do not quite understand your question.

Q. The question is simply this: Does Metropolitan Carbonic Company, or you, or your family, own any interest in the other plaintiff?

A. No, all the stock of that company is owned by the parent company.

Q. Do you receive a salary from either one of the plaintiffs?      A. Yes.

Q. From both of them?      A. From one.

Q. Do you have any other financial interest in the outcome of this litigation? [537]

A. None that hasn't already been mentioned.

Q. You testified that after December, 1930, as I recall, you had no connection for some years with the solid CO<sub>2</sub> industry, is that correct?

A. That is correct.

(Testimony of Harry W. Cole)

Q. When was your next connection with the solid carbon dioxide industry?

A. I have never been connected with it since, only through these plaintiff corporations.

Q. Wasn't the Metropolitan Carbonic Company active in the field of solid carbon dioxide after December, 1930, Mr. Cole?

A. No, it never was active.

Q. Weren't you, after December, 1930, associated with Mr. George Petty in a business venture?

A. Yes; and I still am.

Q. Did not some of those business ventures relate to the field of solid carbon dioxide production or sale?

A. Not in connection with the production.

Q. These business ventures did relate to the sale of solid carbon dioxide?

A. Yes.

Q. Another associate was Mr. Bronstein, is that correct?

A. No.

Q. Were you never associated with Mr. Bronstein after December, 1930? [538]

A. No.

Q. Your activities with regard to the sale of solid carbon dioxide covered what period from December, 1930, to date?

A. I was associated with the Carbonic Gas and Service Corporation from about May, 1931, until December, 1934. I was associated with Chemical Gases, Incorporated, from around the middle of 1935 until about August of 1936. That is all.

Q. What business is conducted by the International Carbonic Engineering Company other than licensing others?

A. I don't think they have ever had any other business: no business of any remunerative characteristic, whatsoever.

(Testimony of Harry W. Cole)

Q. All of the licenses that plaintiff, International Carbonic Engineering Company, has issued, do they all relate to the field of carbon dioxide?

A. I believe they do, all of them.

Q. Can you tell me how many United States Letters Patent the plaintiff, International Carbonic Engineering Company, owns title to, or licensing rights under?

A. I couldn't tell you exactly, no.

Q. Approximately?

A. I presume seven or eight.

Q. Seven or eight?             A. Seven or eight.

Q. My question contemplates, Mr. Cole, the number of [539] United States patents that the plaintiff, International Carbonic Engineering Company, either owns title to or licensing rights under. Did you understand the previous question to be that?

A. No, I didn't understand that.

Q. Now, will you answer it with that understanding?

A. The question is, how many patents does International Carbonic Engineering Company either own or have rights under?

Q. Licensing rights under.

A. I don't recall of any licensing rights that they have. There may be seven or eight patents that the company owns outright, and they have a part interest in a number of other patents. Just how many, I couldn't say. Some of them are in the field of production; some of them are in the field of use patents.

Q. Can you state approximately how many United States patents plaintiff Carbonic, Inc., has title to, or licensing rights under?

A. I should say in the production field about somewhere in the neighborhood of 40 of those licenses.



(Testimony of Harry W. Cole)

Q. By production field, you mean production of solid CO<sub>2</sub>, is that correct, Mr. Cole?

A. Yes. We don't have much of anything but the solid field covered.

Q. Has either one of plaintiffs, to your knowledge, ever granted a license under only the patent in suit to anyone? [540]

A. No, I don't think they have.

Q. You have stated that you are familiar with the patent in suit. I presume that you were familiar with the application for the patent in suit, while it was being prepared, and when it was filed?

A. Yes.

Q. And with the drawings and specification of that application?

A. That's right. I helped prepare them. [541]

\* \* \* \* \*

Q. By Mr. Foster: I understand the first conception of yourself and Mr. McLaren on the subject matter of the patent in suit was in the late summer of 1925, you stated?

A. That's right.

Q. Can you give me the month, please, Mr. Cole? Permit me to modify that last question; I don't want to mislead you. I believe your testimony was, on direct examination, that the conception of the patent in suit was in the late summer of 1925; is that a fact?

A. Yes. Our real discussions with regard to this development were picked up immediately following about the 4th of July. I think we were having a terrific amount of difficulty in that particular period with our relationship with the Dry Ice Company, due to the fact that there was a [542] lot of hot weather, and they were in difficulty not in getting enough of the product and the volume of gas they were using, and the amount of ice produced was very, very small, and that situation was

(Testimony of Harry W. Cole)

really the thing that impelled us at that particular time to begin to think about what could be done to obviate these sort of difficulties. Just when it happened I don't know; whether it was in the month of July, or in the month of August. You see, at that particular time we were building a liquid plant in Chicago, and at that time we did considerable traveling back and forth, and we spent some time in Chicago together, and it was during that period we made our first conception.

Q. You say you spent some considerable time together. Do you mean yourself and Mr. McLaren?

A. That's right.

Q. During that time, by that phrase you meant during July and August of 1925? A. That's right.

Q. And it was during July or August, some time in 1925, that this conception of the device illustrated in Fig. 5 of the patent in suit occurred? A. That's right.

Q. Prior to that time the Dry Ice Company had come into the plant of your company, and started this development work in connection with the snow tank?

A. No, any development they had in connection with [543] the snow tank evidently was behind that, because they came there with producing equipment, which was utilized right through that entire period they were with us.

Q. That was early in May, 1925, that the Dry Ice Company came in with that equipment?

A. That's right.

Q. That equipment included the snow tank, as I understand you? A. Yes.

Q. And it included a press for compressing the carbon dioxide snow made in the tank, into blocks?

A. Yes.

(Testimony of Harry W. Cole)

Q. You observed that operation of this snow tank, and this press, did you, immediately after it was brought into your plant? A. Yes.

Q. Was it part of your duty to be familiar with their operation?

A. Not necessarily in connection with their operation; only so far as it affected our operations.

Q. Did you assist them in these operations?

A. I don't recall that we ever did assist them, other than as you would help out customers, who you thought some time might be a good customer.

Q. I presume as these representatives of the Dry Ice Company commenced work with this equipment, in May, 1925, [544] and you observed it, you from time to time made suggestions about its operation?

A. We did make some suggestions.

Q. To whom are you referring by "we"?

A. Mr. McLaren and myself.

Q. After the 1st of May, 1925, and prior to July, 1925, what suggestions did you or Mr. McLaren make?

A. I wouldn't recall exactly.

Q. Did Mr. McLaren, with you, observe the operations of this snow tank prior to July, 1925, in which liquid carbon dioxide was introduced directly into the snow chamber? A. Yes.

Q. And did Mr. McLaren, with you, prior to 1925, observe the operations of this snow tank in which carbon dioxide in gaseous form was withdrawn from the snow chamber? A. No.

Q. Did you observe it? A. No.

Q. It was my understanding that the snow chamber of the Dry Ice Company included an outlet for the carbon

(Testimony of Harry W. Cole)

dioxide gas from the snow chamber. Did it include such an outlet? A. It surely did.

Q. And gas was discharged from the snow chamber of the dry ice device prior to July, 1925, through that outlet? [545] A. Prior to when, sir?

Q. July, 1925. A. Yes.

Q. And you observed that? A. Yes.

Q. Did Mr. McLaren also? A. Yes.

Q. During these operations of the snow tank of the Dry Ice Company, in your plant, prior to July, 1925, what was the maximum pressure in the operations you observed, upon the liquid carbon dioxide supplied to the snow chamber?

A. So far as the pressure of the liquid supplied to the chamber, it was around 1000 to 1200 pounds, all the way through the entire period that they were in there. I rather object, if I may, to this specific date being referred to in all of your questions, because there was an area in there; they were in there for more than a year, and it is pretty hard for me to go back a matter of 18 or 19 years, and try to say where I was on a certain date, or what happened on that particular date.

Q. I can appreciate that, Mr. Cole, and I ask only for your best recollection. To the best of your recollection, prior to July, 1925, how many snow chambers did the Dry Ice Company have in your plant?

A. That I don't remember directly. I believe they started in operation with one, and I think they eventually [546] had three operating over there. Just when they came in, I am not certain of.

Q. What did you observe as to the thickness of the metal from which that first snow chamber was made?

(Testimony of Harry W. Cole)

A. My recollection is that was made out of about a quarter of an inch of material. In fact, I think that has already been stated in here.

Q. Quarter-inch steel?

A. I think it would be steel, yes; light steel plate.

Q. During these operations of the Dry Ice snow rank, prior to July, 1925, what was the pressure upon the gas which was taken from the snow chamber?

A. That varied considerably. I think they intended the operations and the operators at that particular time to operate at negligible pressure. In other words, the line was directly open, and there was nothing but line resistance on it all the way back to the gas holder that floated on the end. It might have carried 3 or 4 inches of water pressure. It fluctuated by virtue of the fact that there was stoppage, or partial stoppage, in the line at various times, so it did not have continuity of pressure.

Q. These gas holders are invariably back of it?

A. That is correct.

Q. The maximum pressure that could be maintained in a line going to such gas holder would be very small?

A. That is correct.

Q. About how much? [547]

A. I don't know; it would be a matter of ounces, but I want you to remember I am not, and I don't pretend to be an expert. You can get me on a theory; you can get me on these technical matters. I have been out of the field of operations since 1930, and my memory isn't so good on detail.

Q. I don't mean to get you on anything. All I want you to tell us is your best recollection of things you observed, and this operation of the snow tank which you observed prior to July, 1925. The snow was removed



(Testimony of Harry W. Cole)

from the snow chamber and pressed in a mold, as I understood you?

A. That is true, and this same operation went on; there were no changes in the general method of operation from the time they got the snow tanks installed until they removed the snow tanks from the place, and took them away.

Q. These snow tanks you stated arrived a few days after, or a very few days after the representatives of the Dry Ice Company came to your plant, around the 1st of May, 1925?

A. That is my recollection.

Q. These tanks were put in commercial production of solid CO<sub>2</sub>, weren't they?

A. Yes, they went into commercial production, as I recollect, just as soon they were installed, and put to use.

Q. There was no period of experimentation or development? [548]

A. No; in fact, in the interim period they were already, as I understand it, selling commercially, when they came in there.

Q. I think you testified that they had some difficulty with some of the blocks made by this Dry Ice machine being unstable to the point of exploding?

A. That is right.

Q. Did that occur prior to the time Mr. McLaren and you began work on your invention?

A. I wouldn't recall that exactly. I think it might have been.

Q. Don't you recall that it did, and for that reason you had in mind the necessity of keeping pressures low while you were developing your invention?

A. Well, the question of getting into the development of our invention, and that question of pressure control,

(Testimony of Harry W. Cole)

was a matter of later development in there. There was no date of conception back in there. That was an out-growth of our development back in 1926, after we had a machine to work with. We never claimed a conception date of the pressure control as early as we did the Figure 5 machine. [549]

Q. While we are on that point, what is the date that you state was the date of conception of pressure control in the pressing operation?

A. Well, I would say that was along in the winter of 1926-'27, probably.

Q. Can you fix it any better by reference to a month, Mr. Cole?

A. I don't think I can go that close. As I mentioned, within certain areas about what we did, but I can't get specific on those dates. My memory isn't that good. I might be able to dig up documentary evidence. We submitted documentary evidence in the interferences and at that time I was able to testify. I had documentary evidence in front of me. And I am just not that good.

Q. Now, during this operation, the first few days' operation of the dry ice machine in your plant that you observed, was the liquid carbon dioxide supplied to the snow chamber until a desired amount of solid carbon dioxide had been formed in the snow chamber and thereafter the liquid supply shut off?

A. My recollection is that that is the way it operated all the way through. I don't remember just whether the scales were there when they first began to operate, or whether the scales were brought in later as they were found necessary, but my—what I remember of it now is that those tanks were setting on the scales. That is the

(Testimony of Harry W. Cole)

impression [550] that is left after the wear and tear of the years.

Mr. Foster: May I, your Honor, ask the witness to attempt to speak just a little louder?

The Court: Yes. Speak up just a little louder. It is rather hard for me to hear you, too.

Q. By Mr. Foster: And in those operations with this dry ice snow chamber and snow press, the first few days' operation after it arrived in your plant, the snow which was formed in the snow chamber was placed finally in a press; that is correct, isn't it?

A. It was always placed in a press.

Q. And there it was subjected to compression by hydraulic action to form it into a block, is that correct?

A. Yes.

Q. And during that compression the mass of solid carbon dioxide was not completely enclosed, but, on the contrary, there were openings permitting the gas in the solid carbon dioxide to escape during pressing; that is true, isn't it?

A. Yes. I believe there was a floating block on top and bottom.

Q. And you understood during those operations that it was necessary for the gas to escape during the pressing operation to produce a stable block?

A. Yes. We used to see clouds of it going around the place.

Q. What caused this explosion of this block of solid [551] carbon dioxide made with the dry ice apparatus, if it were compressed in this chamber so that gas could escape during the pressing operation?

A. Well, you would have an entrainment of air in there as well as carbonic gas, and that might have had

(Testimony of Harry W. Cole)

something to do with it. But I know you can press carbon dioxide out in the open and you can press it with sufficient rapidity and at high enough pressure, and you will find that your block won't stay a block afterwards. I am not sure but what some of the impurities that may have been in the carbonic gas used might have had something to do with that. I think—and this is more or less hearsay—they tell me that this product varies in different plants, and they can't always operate one just as they operate another, because the characteristics of the liquid may be a little different.

Q. This knowledge that you have stated in your last answer, so far as that answer stated knowledge, you had when you observed these operations of the dry ice equipment there shortly after it was brought in in May, 1925, didn't you?

A. I don't know that I did. You know, it is awfully hard, 18 years later, when probably 90 percent of your knowledge has been picked up since that earlier date, to try to straighten out in your mind what you knew back there and what you didn't know back in that particular time. I can't say whether certain knowledge that I have today, whether I picked it up ten years ago or fifteen years ago or eighteen [552] years ago.

Q. You are unable to answer my question; that is your answer?

A. That is right.

Q. In these operations of the press which you have just described as occurring there in the dry ice press prior to July, 1925, did Mr. McLaren as well as yourself observe them in your company, or didn't he?

A. Sometimes in my company, sometimes probably alone.

(Testimony of Harry W. Cole)

Q. I neglected to ask you in that period of operation prior to July, 1925, what various pressures did you observe that the snow chamber was operated under during the formation of the solid carbon dioxide in the snow chamber?

A. I don't recall exactly. I know there was periods in there that they had pressures that were high. I have seen it leak so it was necessary to relieve the internal pressure by loosening the door. I think there was no effort made to determine exactly what the pressure was. I don't even recall that in the beginning there was a pressure gauge on those machines over there.

Q. You referred in your last answer to a high pressure. What was the highest pressure that you observed in that period during the time that liquid carbon dioxide was being introduced into the chamber?

A. Well, I just told you I am not sure of that. I don't recall at that period that there was a pressure gauge [553] or anything on there that would indicate what the pressure was.

Q. During the total period of your observation of that snow chamber what was the maximum pressure in it that you observed while liquid carbon dioxide was being introduced?

A. What was the maximum pressure?

Q. Yes.

A. I wouldn't recall what that maximum pressure was.

Q. Can you give an approximate value? Was it over 30 pounds?

A. I think it probably went above 30 pounds when they plugged up the blow-back line at times.

Q. It went to about 60 on those occasions, didn't it?

A. I don't know. I don't know what pressure that tank would stand.



(Testimony of Harry W. Cole)

Q. As I understand you, prior to the date of conception by you, first conception by you and Mr. McLaren of the subject matter of Fig. 5 of the patent in suit, you knew and Mr. McLaren knew from observation that solid carbon dioxide could be formed by discharging liquid carbon dioxide into an air-tight, gas-tight chamber and relieving the pressure thereon; that is true, isn't it?

A. Yes.

Q. And you knew that in order to perform that operation it was necessary to withdraw carbon dioxide in gaseous form from that gas-tight chamber?

A. Yes. [554-555]

Q. And you both knew that in such a manner you could form a solid carbon dioxide that could be compressed into blocks as a commercial commodity?

A. Yes.

Q. And you both knew that when you introduced liquid carbon dioxide into a gas-tight chamber and released the pressure thereon a part of the liquid carbon dioxide was converted into a solid and a part converted into a gas? A. Yes.

Q. And you both knew that in order to provide a stable, merchantable block product of solid carbon dioxide it was necessary to compress it in a press under such conditions that carbon dioxide gas contained in it could escape? A. Yes.

Q. And you both had seen operations embodying all of those principles, and all of that knowledge performed by others prior to the earliest date of conception of any of the subject matter of the patent in suit?

A. Yes. We saw practiced just what has been described by Dr. Jones on the stand here as the snow tank operation. That is exactly as it was and as it was

(Testimony of Harry W. Cole)

used in General Carbonic plant, as far as that would teach us anything; yes.

Q. And you both had prior to this earliest date of conception observed that when liquid carbon dioxide was delivered to a gas-tight chamber and the pressure on it relieved there would be formed solid carbon dioxide of such [556] density, such coherency, that it was necessary to use tools to carve it out of the snow chamber; that is true, isn't it?

A. Well, I think you—no. I will answer you no to that.

Q. Do you mean—

A. I can't go all the way with you on the question, that is all.

Q. Let us divide it. Prior to the time that you say you and Mr. McLaren first conceived of the subject matter of the patent in suit, you had observed operations of this dry ice snow chamber which involved the use of a shovel to dig the solid carbon dioxide out of that chamber, hadn't you?

A. Yes. I can perhaps describe the material that I saw taken from the snow chamber. This snow, as it forms, to say it is a light, fluffy snow—well, unless you throw it out on the floor you never see it as light, fluffy snow. If it is made in a chamber where it is impacted by the velocity of the stream of gas from which it is deposited, you never see it light and fluffy. Now, you will always see it packed into a tank or in a closed chamber you make it in. It is about the consistency of a dry snow, water snow, that has been blown by a gale. You have seen it pile up against a windbreak along the railroad track after you have had a lot of wind on it, that you can break it. It is in chunks that it will stay together

(Testimony of Harry W. Cole)

within reasonable reason, and you can step on it and it will almost hold your weight, but it will [557] let you go down. That is the type of stuff that I used to see taken out of there. It was purely a snow operation; it never was anything else but a snow operation. It had nothing of the characteristics that you might say an ice or snow formed at the higher range of pressures which is more like the type snow you see when you have had a thaw and it is frozen over night and you can stand on it. They never had any difficulty over there to get their product out of the side of a tank. It was either a small shovel or a scoop similar to what the groceryman used to use in shoveling his sugar into the paper bag. It was always so you could take it out.

Q. Have you finished your answer, Mr. Cole?

A. Yes.

Mr. Foster: I think I have finished this part of the subject matter of my cross examination. Does the court wish me to continue?

The Court: Yes; go right along, if you don't mind. I would rather stay a little while longer on it.

Q. By Mr. Foster: You have heard the explanation that has been given here by Dr. Jones as to the meaning of the triple point, I take it? A. Yes.

Q. Did you know about the triple point of carbon dioxide there in July of 1925?

A. I knew about the triple point long before that date. [558] I mean just as a matter of the subject it was studied in college. I had thermo dynamics and I almost broke my pick on that very point of the triple point of carbon dioxide. I knew about it.

(Testimony of Harry W. Cole)

Q. And you have heard the explanation here that if we discharge liquid carbon dioxide into a gas-tight closed chamber and relieve the pressure on it, but keep the pressure about 60 pounds, we will accumulate a body of liquid carbon dioxide in the gas-tight chamber so that if we subsequently bleed off the carbon dioxide gas there will be formed carbon dioxide ice in that chamber; you have heard that description? A. I have.

Q. Did you know that in July, 1925? A. No.

Q. You did not know that until considerably later, did you, Mr. Cole? A. No.

Q. When would you say you first knew that?

A. Oh, I think it was along about December, 1928.

Q. And did you learn that from Mr. McLaren?

A. No.

Q. From whom did you learn it?

A. I think probably Dr. Jones told me as much about it as anybody.

Q. You had in the period of 1928 and earlier discussions with Dr. Jones, I understand, with respect to the factors [559] involved in apparatus and methods for the formation of solid CO<sub>2</sub>, is that right?

A. This is subsequent to 1928?

Q. Well, you had some such conferences and discussions in 1928, didn't you?

A. Well, just about during the month of December, perhaps, not earlier than that.

Q. And you had no such discussions with Dr. Jones in any earlier year? A. No.

(Testimony of Harry W. Cole)

Q. They commenced in December, 1928, and continued how long?

A. Well, I was with Dr. Jones off and on during that period until I left the Liquid Carbonic Company at the end of 1930.

Q. When this suggestion was made to you by Dr. Jones in December of 1928 with respect to the formation of carbon dioxide ice from a body of liquid carbon dioxide in a gas-tight chamber was Mr. McLaren present?

A. Yes; I believe he was.

Q. Can you tell us where that meeting or discussion took place?

A. It was over in the General Carbonic Company plant at Long Island City.

Q. And who was present besides the three you have mentioned? [560]

A. I am not just certain. I believe Mr. Brown of Liquid Carbonic, and Mr. Rust, who was then president of Dry Ice Company, may have been present. I am not just certain who was there.

Q. Can you state what Dr. Jones said at that time on that subject?

A. I remember one thing very distinctly; yes. He said that—his remark with reference to it was that it was a dual machine that had two—that could operate on the triple point as well as on snow, and it was the very thing he had been looking for.

Q. Now, you have—

Mr. L. S. Lyon: I think that is the exact statement which the defendants' counsel objected to when Dr. Jones was asked.

The Court: Then you have now got it in the record.

Mr. L. S. Lyon: That is right.



(Testimony of Harry W. Cole)

Mr. Foster: Are you objecting, Mr. Lyon?

Mr. L. S. Lyon: No.

Mr. Foster: I didn't understand the purpose.

Q. You have stated that in the late summer, July or August of 1925, you and Mr. McLaren first conceived the subject matter illustrated in Fig. 5 of your patent. When did you first conceive the subject matter illustrated in Figs. 1 and 2?

A. Well, the Fig. 2 machine grew out of a discussion that [561] we had over our first conception of the Fig. 5 machine, and it was shortly thereafter.

Q. Well, can you tell me the month?

A. Oh, it might have been the last of July or along in August sometime.

Q. July or August of—

A. One followed right directly behind the other. It was a matter of perhaps a few days or a few weeks.

Q. And when was the machine first completed and successfully operated, that is, operated to your complete satisfaction, which machine was identical with Fig. 5 of the patent in suit?

A. Well, I think we got our first drawings that we submitted for bids, were along in February of '28. The machine was ordered sometime shortly thereafter. The machine was delivered around the latter part of September in 1928, went into operation sometime along the latter part of November or first of December, 1928. That is Fig. 5.

Q. I beg your pardon?

A. That is Fig. 5 we are talking about.

(Testimony of Harry W. Cole)

Q. Yes. When did you first succeed in operating that apparatus to your satisfaction, Mr. Cole?

A. Well, that apparatus hit on all six the minute we turned the gas flames on it.

Q. When did you first operate to your satisfaction an apparatus like Figs. 1 and 2 of your patent? [562]

A. Now, I want to differentiate between this Fig. 1 and 2, because Fig. 1 has got a lot of stuff in it that Fig. 2 don't have, and it is not fair to ask me to make a reference to two different things and make an answer to them. Now, if you mean Fig. 2, then I can answer that better if you make it two questions instead of one.

Q. Doesn't Fig. 2 illustrate a part of the apparatus of Fig. 1? A. A part of it only.

Q. Did you ever successfully operate an apparatus such as is illustrated in Fig. 1 of this patent in suit?

A. Yes.

Q. When, first?

A. Well, that is something, again, that was not all—we didn't get a flash in the pan and see a picture of all this stuff. This grew out of a development over a period of time, and what we got on Fig. 1 here includes the outgrowth of the study and the period that went on, which started back in the summer of 1925, and it carried on up to the point of the application for the patent, which I think was along in May, 1928. Now, we picked up things as we went along, and this Fig. 1 covers those things that were picked up as well as what the original idea was.

Q. That is, the application when it was filed contained the results and the knowledge, all of the knowledge and results that you and Mr. McLaren had acquired previously and [563] up to that time with respect to

(Testimony of Harry W. Cole)

methods and apparatus for making this solid CO<sub>2</sub>, is that correct?

A. And included the results obtained through actual reduction to practice.

Q. Is your answer to my question "Yes"?

The Witness: May I hear the question again, please?

(Question read by the reporter.)

Q. By Mr. Foster: That is correct, isn't it?

A. I think probably it is. I wish you would ask me simple questions. I have got a simple mind and you drag these questions out so long that by the time I get what is in the last part I forget what is in the first part.

Q. They are rather long.

A. I am not trying to block you off. I am trying to answer your questions and I am trying to give you an honest answer to them.

Q. I know you are, and I am not trying to confuse you by the length of my questions. Now, can you tell me, to the best of your recollection, the earliest date when you and Mr. McLaren successfully operated the apparatus illustrated in Fig. 1 of the patent in suit?

A. Oh, I think it is safe to say around May or June, 1927.

Q. And when did you or Mr. McLaren first successfully operate the apparatus which is illustrated in Fig. 2 of the patent in suit? [564]

A. About the same time. I think around May of 1927. I think about that time we were getting about as good production out of it as we ever got later.

Q. Do you mean by that, the production that you got by the apparatus of Fig. 2 of the patent was never very good?

A. No; I wouldn't say that.

(Testimony of Harry W. Cole)

Q. Was it commercially acceptable?

A. Oh, yes. We sold all that we made.

Q. You stated that your discussions with Mr. McLaren with respect to devising this method and apparatus of the patent in suit commenced shortly after July 4, 1925. Can you tell us the substance or the words of those discussions?

A. Not very well. That is too far away.

Q. Well, you did remember on direct examination that some discussion was had with respect to the necessity for economies in the operation of the Dry Ice Company; you and Mr. McLaren discussed that, I understood?

A. Yes; we discussed that and we discussed a lot of other angles to it, drew pictures of it, tore them up and threw them away, and started the next day.

Q. And the object—

A. Dragged the whole thing back and forth across the country two or three times.

Q. What did you drag back and forth across the country?

A. Just the ideas that was being threshed around.

Q. The first idea that you had for an apparatus for [565] making solid carbon dioxide which would accomplish the economies you wished, what was that? What was the first form that you conceived of it?

A. Well, the first form we thought of was of the vertical type machine of Fig. 5 type, because the thing we tried to do was to eliminate what seemed to be the faults in the methods that were then being used; and our first thought was to, if we can, let us eliminate them all; let us get rid of the snow tank; let us get rid of the transfer of the material; let us get rid of the tamping;

(Testimony of Harry W. Cole)

let us get rid of the external pressing; let us do this thing all in one leap.

Q. Did you suggest that to Mr. McLaren? Can you remember when?

A. I think it would be difficult to say who hit the idea first. It just sort of grew out of our discussions.

Q. You were aware that the losses or low yield which you wished to avoid in the dry ice operations was due to the fact that the snow had to be transported from the snow chamber to the press, as I understood you; you knew that?

A. We knew that was one of the losses; yes.

Q. And that was one of the losses which you wished to avoid? A. That is right.

Q. And you concluded that you could avoid that loss if you had the pressing operation and the snowing operation [566] performed in the same apparatus?

A. Yes.

Q. Now, whose idea was that?

A. That, again, is just one of those things that grew out of our discussions.

Q. Do you wish the court to understand that in these discussions, in some particular discussion you and Mr. McLaren said, in chorus, let us do the pressing and the snowing in the same machine?

Mr. L. S. Lyon: If your Honor please, I don't think that is proper cross examination. I think it is argumentative. The witness has testified—

The Court: I think so; it is argumentative.

Mr. Foster: I will withdraw the question.

Q. What is your best recollection as to whether you suggested that idea to Mr. McLaren or he suggested it to you?



(Testimony of Harry W. Cole)

Mr. L. S. Lyon: I submit that has already been asked and answered, your Honor, and again, it is argumentative.

The Court: I think he said that it was almost concurrent; he didn't know which was which. Isn't that correct?

Q. By Mr. Foster: Is that correct? The court asked you that. A. Yes.

Mr. Foster: Very well, your Honor.

Q. You had never before July, 1925, seen a device in which solid carbon dioxide was formed and pressed in the same [567] apparatus?

A. No; I never saw but the one operation at Long Island that was being commercially conducted by the Dry Ice Company at that time.

Q. And you had never seen prior to July, 1925, any description in any literature of a machine in which solid carbon dioxide could be formed and compressed in the same machine? A. No; I had not.

Q. The conception which you say you and Mr. McLaren had here in July or August, 1925, will you define for the court what that conception was?

Mr. L. S. Lyon: I object to that as not cross examination. I don't know how you define a conception.

Mr. Foster: He conceived a device and I am asking him to tell us what it was he conceived.

Mr. L. S. Lyon: I think, your Honor, he might be asked what the device was that he thought of.

The Court: Yes.

Mr. L. S. Lyon: But, to define a conception, I wouldn't know how he could do it.

The Court: He may describe the apparatus he conceived of.

(Testimony of Harry W. Cole)

Q. By Mr. Foster: What was the apparatus first conceived in July and August, 1925, to which you referred?

A. Well, I don't know as we had details as they show in the patent drawing. Those just didn't spring into mind just [568] as they are on the drawing there. Your invention covers a number of features. It is very difficult to go back a matter of 18 or 19 years and say that discussions went on back in that period, developed on a certain day a certain set picture.

Q. Well, you say that the invention involved several features and you have fixed July or August, 1925, as the date when you and Mr. McLaren jointly made some conception of the apparatus of this invention.

A. Well, that was the starting point.

Q. All right. Now, as of that first conception to which you referred in fixing the time as July or August, which of the features that you say are included in the invention of this patent were conceived of then?

A. Well, there was the broad feature of the elimination of the undesirable factors of the processes and the apparatus as used in the art at that time.

Q. What form of apparatus was conceived at that time to avoid those difficulties? That is my question.

A. Well, I would say our first idea was to do all this in a single chamber.

Q. And that is the conception you referred to in fixing the date of first conception as July or August, 1925, is that correct, Mr. Cole?      A. Yes, sir.

Q. And were any other features of the invention which you [569] say includes several conceived at the same time?

(Testimony of Harry W. Cole)

A. Well, there was the other features that followed, were strung out during that whole period. [570]

Q. What was the next feature of the invention that was conceived by you and Mr. McLaren?

A. I don't know.

Q. What were the other features of the invention that were conceived of by you and him?

A. Well, those are all covered in the patent drawings.

Q. You have said that there were several features of invention, in one of your recent answers, and you have referred to one as a broad concept of pressing and snowing in one machine? A. That's right.

Q. What were the other features of invention that you had in mind in making that answer, that the invention had several features?

Mr. L. S. Lyon: I object to that as not proper cross examination, and argumentative.

Mr. Foster: This applicant was asked on his direct examination for his dates of conception of the apparatus of this patent.

The Court: I think that is true. I think the form of the question is not perfectly desirable. Suppose you just reframe it.

Q. By Mr. Foster: What are the other features of the invention of the patent in suit which were conceived by you and Mr. McLaren?

A. Well, that described or illustrated in Figure 2, [571] and the various elements shown symbolically in this schematic Figure 1. The elements are all over the page. Do you want me to point to them and show you what they are? [572]

HARRY W. COLE,

recalled.

The Court: You may proceed.

Mr. Foster: No further cross examination on behalf of the defendant, the George Pepperdine Foundation.

The Court: You withdraw that last question then, in order to clear the record?

Mr. Foster: Yes; I do so, your Honor.

Cross-Examination

Q. By Mr. Miketta: Mr. Cole, I would like to have you examine Defendants' Exhibit D for identification and let me know whether you have seen a machine such as is shown on this drawing at any time?

The Court: Would you identify that drawing for the record, Mr. Miketta?

Mr. Miketta: Defendants' Exhibit D for identification is a machine for pressing—

The Court: Yes; I know what it is, but I wanted the record to show.

A. No; I have never seen a machine or a drawing like that before, excepting as it was offered here in the evidence.

Q. By Mr. Miketta: You do not recall seeing that [574] particular machine at the Sixth Street and East River plant of General Carbonic Company in the late fall of 1926 or during the winter of '26-'27?

A. No; I never saw this machine.

Q. Were you at that plant during that period of time?

A. The fall of '26 and '27?

Q. Yes.

A. Yes; I was there, off and on.

Q. Was Mr. McLaren at that plant at that time?

A. Yes; he was.

(Testimony of Harry W. Cole)

Q. Did you see one substantially like that?

A. No.

Q. Did you see any machine in which snow could be formed and pressed into blocks during that period of time?

A. No.

Q. Did you see a machine of that type at the Maspeth plant of the Liquid Carbonic Corporation?

A. No.

Q. You have never seen a machine like that?

A. Never.

Q. Your answers are the same whether the question refers to the interior of the plant or to areas adjacent the plant, is that correct?

A. Yes, sir.

Q. By the Court: Have you ever seen any detailed drawings of such a machine, one that you would consider to be similar— [575]

A. No; I have not.

Q. —or identical to it?

A. No; I have not.

Q. By Mr. Miketta: Did Mr. McLaren at any time speak to you about a machine of that sort?

A. No; he never did.

Mr. Miketta: That will be all, your Honor.

The Court: Any further redirect?

Mr. Morris: We have no redirect. [576]

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The Court: Any further cross?

Mr. Foster: No.

Mr. Miketta: I have none.

Mr. Morris: I am going to rest as soon as Mr. Lyon has [580] examined this.

The Court: There is no use of doing that.

Mr. Morris: The plaintiffs rest. [581]

\* \* \* \* \*



(Testimony of Harry W. Cole)

Mr. Foster: May it please the court, Mr. Miketta and myself have conferred and consulted our clients with respect to the suggestion made by the court near the close of yesterday's session. Our plan of presenting our evidence, which we had agreed upon some time ago, involves the introduction of evidence with respect to the defendants' operations, first, and with respect to the prior art thereafter.

We respectfully petition the court for leave to pursue that plan. We have been able, in the light of the evidence presented in plaintiffs' prima facie case with respect to prior art devices and prior knowledge, to reduce to some extent the amount of evidence we think it necessary to introduce; so that we are quite sure that we can expeditiously, by direct examination, present our entire case in not too much time. We would like the privilege of presenting it all, having in mind the statement made by the court yesterday afternoon that if a ruling were made upon our motion to dismiss for the failure of plaintiffs to make a prima facie case, it might well be that the parties would be put to much more expense and the court to the expenditure of much more time by the passage of that ruling through the Circuit Court of Appeals, and perhaps the Supreme Court, and then back here. [687]

I think the same reasoning would apply to a direction that the defendant present less than its entire case. For example, if it present only evidence of its operations and non-infringement, for the reason that if we got to the Appellate Court with such a record, the Appellate Court would be unable, if it disagreed with the grounds of the decision in favor of the defendants, to find out any other grounds, since the record would not be there. And, as your Honor is well aware, sometimes the Circuit Court of

(Testimony of Harry W. Cole)

Appeals will affirm a holding for the defendant, though it will disagree with the lower court's finding of non-infringement, the Circuit Court of Appeals preferring a ruling of invalidity, nevertheless, unless the evidence of that art is there defined.

I would also mention these facts: Some of our witnesses are engaged in vital war work and some of them have come from considerable distance, and therefore we would like to as expeditiously as we can—and I think it will be quite expeditiously—present the defendants' entire case according to the plan that we had considered.

The Court: So permitted. [688]

\* \* \* \* \*

EARL P. WELLS,

called as a witness by and on behalf of the defendants, having been first duly sworn, testified as follows:

The Clerk: State your full name, please.

A. Earl P. Wells, Glendale, California.

Direct Examination

Q. By Mr. Miketta: Will you state your present occupation, Mr. Wells?

A. I am manager of the refrigeration department of the Gay Engineering Company, refrigeration contractors, in Los Angeles.

Q. For how long have you been in that position?

A. I have been acting as manager about two years; prior to that, about four years as sales engineer.

Q. What engineering training have you had?

A. I graduated from the University of Illinois with a B.S. in general engineering, and I have spent all of my

(Testimony of Earl P. Wells)

time since then, 1926, in refrigeration and air-conditioning work, operations, research, and contracting.

Q. Have you had courses in mechanical engineering?

A. Yes, at the University of Illinois. It was a four years' course in engineering. Then I had some graduate work in refrigeration at the University of Michigan.

Q. Have you at any time visited the plant of the Natural Carbonic Products Company at Niland, California?

A. Yes, I was designer and contractor in rebuilding [693] the plant, in 1940. I visited the plant once or twice each year since then.

Q. Prior to 1940 did you ever visit that plant?

A. I was there in 1939, when the plant was owned by the Pacific Imperial Dry Ice Company.

Mr. L. S. Lyon: I move to strike the last statement out, on the ground that no foundation has been laid, your Honor.

The Court: It may be stricken.

Q. By Mr. Miketta: Did you visit the plant located at Niland, California, at any time prior to the time that it was owned by Natural Carbonic Products Company?

A. No; because the plant was taken over, I believe, in January, 1940, and our work started in March. I was at the plant, of course, between January and March, 1940.

Q. Were you ever at that plant before it was owned by Natural Carbonic Products?

Mr. L. S. Lyon: I object to that upon the ground that no proper foundation has been laid; the witness has not shown any knowledge of who owns this plant.

The Court: Objection sustained.

Q. By Mr. Miketta: Who owns that plant at Niland, California, at the present time, or in 1940?

(Testimony of Earl P. Wells)

Mr. L. S. Lyon: Objected to; no foundation laid.

The Court: Objection sustained.

Q. By Mr. Miketta: At the time of your first visit to the plant at Niland, California, did you observe any equipment at [694] that plant?

A. Yes, the plant had two Frick presses and sufficient equipment to make about theoretically, I think, ten tons per day.

Q. Who employed you to go down to Niland, California?

A. Do you mean at the time of my first visit to the plant?

Q. Yes.

A. The Pacific Imperial Dry Ice Company.

Q. When was that? A. That was in 1939.

Q. On your subsequent visit, in 1940, who was the employer?

A. Natural Carbonic Products, Incorporated.

Q. Did you see those two Frick presses in operation, Mr. Wells? A. Yes, I did.

Q. What was being manufactured?

Mr. L. S. Lyon: I would like to have the time fixed, if your Honor please.

The Court: Yes, fix it just a little more definitely, if you will.

Mr. Miketta: Q. I understood you to state that you were there in the spring of 1940, is that correct?

A. That's right.

Q. At that time, during the spring of 1940, you observed [695] the two Frick presses, is that correct?

A. That is correct.

Q. Did you actually see the presses in operation at that time? A. Yes, I did.

(Testimony of Earl P. Wells)

Q. What was being manufactured?

A. Carbon dioxide ice.

Q. You are familiar with liquid carbon dioxide?

A. Yes, I am.

Q. Will you please describe one of the Frick presses that you saw?

A. The presses are the vertical type, in which the platen which closes the chamber is at the upper end. The platen which does the compressing is at the lower end. Both platens are moved by hydraulic means. There is a liquid inlet and a gas outlet to the pressing chamber. That is about all.

Q. What liquid is supplied to the chamber by the inlet?

A. Liquid carbon dioxide.

Q. You say there was a return line?

A. Yes, a gas removing line, connected between the press chamber and a compressor.

Q. That compressor is part of what organization or system?

A. It is part of the liquefaction system of the plant, liquefying carbon dioxide. Its purpose is to raise the [696] pressure of the gas from the press to the liquefying pressure.

Q. Were there valves on the inlet line and on the outlet line?

A. Yes.

Q. Were there any other means of ingress and egress from that chamber?

A. On the line going to the compressor, between the press and the stop valve there is a branch line, which is used for venting the press chamber to the atmosphere.

Q. You stated that you saw the presses in operation?

A. Yes.



(Testimony of Earl P. Wells)

Q. Your description of this one Frick press would be the same regarding the other Frick press?

A. Yes; they are identically the same.

Q. During the operation of the press, Mr. Wells, was that vent to the atmosphere operated?

A. Yes; it was operated whenever the pressure in the press had dropped, after snowing, to approximately five pounds.

Q. Do you have in your possession a drawing showing the Frick presses which you observed during the spring of 1940?

A. Yes.

Q. Will you please produce that drawing?

Mr. L. S. Lyon: I don't believe this drawing has been exhibited to use in accordance with your Honor's direction at our conference. I am reminded that yesterday Judge McCormick refused to allow, in a patent case being tried there, [697] additional documents, and additional exhibits, which should have been exhibited at the pre-trial conference, and were not: I think your Honor's directions were clear enough in the letter received by counsel, and why we were not shown this drawing, I do not know.

Q. By Mr. Miketta: Where has this drawing been since you obtained it?

A. It has been in my possession all the time. [698]

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The Court: Can't you do this, Mr. Miketta: Can't you withhold this portion of your examination having to do with this drawing until Tuesday? Let plaintiffs' counsel have [700] this drawing over Sunday, have it available to them here in the courtroom to study it, so that they will have an opportunity to make such examination on voir dire

(Testimony of Earl P. Wells)

as they may want to make; and then I will permit you to go ahead with this at that time.

Mr. Miketta: Very well, your Honor. May I have that marked for identification at this time?

The Court: Yet; let it be marked for identification.

The Clerk: Defendants' H.

Mr. Miketta: Defendants' H. [701]

\* \* \* \* \*

Q. By Mr. Miketta: I show you Plaintiffs' Exhibit 3, Mr. Wells, and ask you to point out whether that drawing shows all of the elements which were a part of the Frick press at the plant of Natural Carbonic Products, Inc., at Niland, California during the spring of 1940 when you first observed that Frick press?

A. I see no vent to the atmosphere in this drawing, unless it may be in a schematic—

Q. Will you please indicate in pencil on such drawing the location of the—

Mr. L. S. Lyon: Wait just a minute. I object to modifying Exhibit 3. I do not think this witness should be allowed to make any physical change on Exhibit 3, which is the plaintiffs' exhibit.

The Court: Objection overruled. He may mark it and put his initials on it. It is done in open court. And do it in a red or some other type of pencil.

A. At this point on the blowback outlet there is—

Mr. Morris: May we come to the bench?

The Court: Yes; come right up here.

A. There is a vent valve to the atmosphere. There is a pipe going from that valve up about four or five feet, so the gas is discharged vertically. [703]

(Testimony of Earl P. Wells)

The Court: Let the record show that the witness has put a cross on the apparatus in Plaintiffs' Exhibit 3—

Mr. Miketta: Exhibit 4, your Honor.

The Court: This is 3 in evidence.

Mr. Miketta: Pardon me.

The Court: —part way up on the blowback outlet and has indicated by a line that that represents a vent valve. The marks put on by the witness are in red pencil.

Q. By Mr. Miketta: Will you also refer to the other sections or other portions of the drawing, Mr. Wells, and compare those with the apparatus that you observed at the plant at that time?

A. Yes. This is substantially correct. There is the upper and lower hydraulic cylinders, upper platen which closes the chamber, a liquid line connects to a pipe which connects to the snow chamber.

Q. You are referring to this as the liquid line?

A. The liquid line at this point, which has a valve connection to a larger pipe connection which is connected to the pressing chamber for the admission of liquid or snow.

Q. Will you indicate in red pencil what you referred to as the pressing chamber?

A. This is the pressing chamber.

Q. Do you mind writing—

The Court: Let the record show a "V" mark on the chamber on Exhibit 3 in red. [704]

Q. By Mr. Miketta: Now, calling your attention to the pipe diagrams appearing on Exhibit 3, are they an accurate representation of the various pipes, valves, and connections associated with the press as you saw it?

(Testimony of Earl P. Wells)

Mr. L. S. Lyon: I would like the record to show whether or not this witness has ever seen this drawing and studied it before it is presented to him here on the stand, your Honor.

The Court: Oh, if he can answer the question, he can answer it. If he can't, he can't.

Mr. Miketta: I object to the question at this time, your Honor. I think it is proper on cross examination.

The Court: That is true. Do not mark the drawing without the court's permission.

A. The schematic diagram does not show the vent valve.

Q. By Mr. Miketta: You are referring to which one?

A. To the lower schematic drawing; and this drawing also shows a heat exchanger between the snow trap and the compressor which was not in existence at the spring of 1940 before we re-built the plant.

Mr. Morris: May I have that answer read? I missed a word.

The Court: Yes.

Mr. Morris: "before we"?

The Court: "re-built the plant."

Mr. Morris: Did he say "we"? [705]

The Reporter: That is correct.

The Witness: That is correct.

Q. By Mr. Miketta: To whom do you refer by "we"?

A. Gay Engineering Company, a corporation at that time.

Q. Could you indicate on the lower schematic diagram appearing on Exhibit 3 the location of the air vent to which we have referred?

A. Yes. I can mark that on there if you wish.

(Testimony of Earl P. Wells)

Mr. L. S. Lyon: I would like to have the same objection, your Honor, that I made before to the witness altering Plaintiffs' Exhibit 4.

The Court: He has not altered it yet. Read the question.

(Question read by the reporter.)

The Court: He does not need to mark it to do that, if he will just point it out.

A. Yes. This is the line leading the gas from the press back to the snow trap and the compressor, and the branch connection is located at this point between the chamber and the stop valve; similarly on the other press.

The Court: Take your red pencil and indicate by a line, mark the course of that.

A. That is the stop valve on that vent line.

The Court: Very well. Let the record show the two red crosses on the lower schematic drawing made by the witness.

A. The other schematic drawing also will perhaps be marked in the same manner, because it shows the same thing in [706] enlarged view.

The Court: All right; put it on that one also, and let the record show it is being done.

Q. By Mr. Miketta: Mr. Wells, you have indicated on this upper schematic diagram a little line extending upwardly from the upper dotted line extending from the snow chamber towards the right, have you not?

A. That is right.

Q. And the cross at the upper end of that line indicates what?

A. The valve.

Q. To what is the valve connected?

A. There is a section of about four feet of one-inch pipe connected to that valve.



(Testimony of Earl P. Wells)

Q. Into what does that empty?

A. It empties into the atmosphere above the press.

Q. And that same construction applied to both presses?     A. Both presses were the same.

Q. Do you recall whether you have seen a drawing such as Plaintiffs' Exhibit 3 and had been asked to modify it or change it in any way—

Mr. L. S. Lyon: Will you read that question?

Q. By Mr. Miketta: —prior to this time?

Mr. L. S. Lyon: Will you read that question to me, please?

(Question read by the reporter.)

Mr. L. S. Lyon: I object to that as immaterial, [707]

The Court: Objection sustained.

Q. By Mr. Miketta: You have stated, Mr. Wells, that you were employed by Natural Carbonic Products, Inc. to do some work down at their Niland plant. Will you please state what that work consisted of? Did it have anything to do with these presses?

A. No. We had no work in connection with the presses, although I was preparing to do some work on the Frick presses at the time that the Natural Carbonic Products, Inc. took the plant over from Pacific Imperial Dry Ice Company. I had been studying the presses at that time.

Q. Have you repeatedly visited the Niland plant since that time?

A. Yes; I have been there once or twice each year or oftener since that time.

Q. What is the most recent visit that you made at the plant?

A. I believe it was April the 22nd of this year.

(Testimony of Earl P. Wells)

Q. Has the construction of the Frick press and the arrangement of the valves and pipes which you have indicated on Exhibit 3 changed in any particular since that time?

A. The only change that I am aware of that has been made since 1939 has been a substitution of leather packings for piston rings in the upper hydraulic cylinder, with possibly also a change in the sealing arrangement of the upper plate. There has been no change, to my knowledge and inspection of [708] April 22nd, to the valve arrangement or the pipe arrangement with the exception, perhaps, of the substitution of a plug type valve on the liquid line for a needle valve which was installed there in 1939.

Q. By the Court: The plug type was installed then?

A. No; the plug type has been installed since then; I should say about two years ago.

Q. A needle valve in it before?

A. That is right.

The Court: Speak up just a little louder. I don't think Mr. Foster can hear you well and these other gentlemen here are all interested.

Q. By Mr. Miketta: But on all of your visits to the plant you have observed that air vent valve as you have indicated it on Exhibit 3, is that correct? [709]

\* \* \* \* \*

A. Yes.

Q. By Mr. Miketta: And you have seen the presses in operation at various times since the spring of 1940?

A. Yes.

Q. Is that correct? A. Correct.

Q. What was your first contact, Mr. Wells, with pressing or molding machinery?

Mr. L. S. Lyon: I object to that as immaterial.

(Testimony of Earl P. Wells)

The Court: Objection overruled. It is a matter of his qualifications. [710]

A. I should say that during the past ten years I have seen various types of presses, such as wine presses and rubber molding presses. My first contact with rubber molding presses was in 1920, when I was employed at the Brunswick-Balke-Collender Company.

Q. Since 1920, in addition to rubber molding presses and wine presses, have you had contact with other presses and pressing operations?

Mr. L. S. Lyon: I object to this, your Honor, upon the ground that no issue is pleaded in the answer. There is no pleading of any prior knowledge by this witness of any prior art, prior art structures.

The Court: It is a matter of qualification of the man as an expert. Otherwise it would not be admissible. Objection overruled. You may answer.

A. I cannot recall any other types of presses that I worked with.

Q. By Mr. Miketta: Referring to your rubber molding presses, about 1920, will you describe very briefly the elements of such a press?

Mr. L. S. Lyon: I object to that upon the ground that it is not pleaded; it is not admissible under the issues. Obviously, it is not for the purpose of establishing the experience of this witness. but to establish experience with something alleged to be in the prior art, of which no notice is given. [711]

Mr. Foster: As Mr. Lyon well knows, no notice is required by statute, to introduce evidence showing the state of the art, and certainly this witness is qualified to help the court in showing what was old, and showing the state of the art. The objection does not lie.

(Testimony of Earl P. Wells)

Mr. L. S. Lyon: If the evidence is offered for the limited purpose of construing the patent on the issue of infringement, I concede it may be introduced for that purpose without pleading, but the court should rule that it is not to be received on the issue of validity, either of anticipation or invention, and for authority on that specifically—

The Court: You don't need any. I don't think there is any doubt about the law. I think it is only admissible for the limited purpose indicated, and it will be so restricted. You may answer.

A. These presses had movable platens, by hydraulic and screw means, which closed the molds against other movable platens. Some of the molds were hollow, and were for the purpose of conforming soft rubber to molds in which they were heated by steam for hardening purposes.

Q. Have you finished your answer? A. Yes.

Q. Were the platens movable toward one another?

A. Yes.

The Court: That means reciprocally so? [712]

A. Yes, sir.

Q. By Mr. Miketta: How would you describe the chamber when the platens were in their closest position to one another?

Mr. L. S. Lyon: May it be understood that the evidence on this subject is controlled by your Honor's ruling, without further objection?

The Court: Yes, to this entire line, to save time and trouble of doing it over again. [713]

\* \* \* \* \*

The Court: You may proceed.

(Testimony of Earl P. Wells)

Q. By Mr. Miketta: Mr. Wells, assuming that you have a chamber, or assuming that in the Frick press the only elements you have consist of the walls which form the chamber and the piston and the platen; and assuming that these three elements, the piston, the platen, and the walls form a closed, completely gas-tight chamber, could you make snow in that, carbon dioxide snow?

Mr. L. S. Lyon: I object to the question as indefinite and uncertain and as immaterial. There is no issue of that kind in this case, that you could make ice in an apparatus that had nothing to it except some walls and two platens.

The Court: Objection overruled.

A. If liquid carbon dioxide could be admitted to the chamber, snow would be formed in there until the pressure reached 60 pounds gauge, but not above that pressure.

Q. By Mr. Miketta: I show you Defendants' Exhibit A for identification and particularly call your attention to the assemblage shown and identified as A on this exhibit; could you make snow in that?

A. Not without an inlet.

Mr. L. S. Lyon: I object to that, your Honor, on the ground that that is incomplete and leading. Certainly, just using the word "that" here—can the witness make snow in "that"—there is no foundation laid that the witness has any experience in this thing. [727]

The Court: Yes. I think you had better just briefly describe this thing here.

Q. Were you in court when this was testified to?

A. Yes, sir.

Q. You heard the testimony with regard to it?

A. Yes, sir.



(Testimony of Earl P. Wells)

The Court: You may answer.

A. There is no means shown for admitting liquid  $\text{CO}_2$  to that chamber; so it is impossible to make snow in there. [728]

\* \* \* \* \*

Q. I call your attention, Mr. Wells, to the device illustrated and identified by the letter B on Defendants' Exhibit A for identification; and in that device you will note I specifically call your attention to the fact that there is a pipe provided through the wall of the chamber. Could you make snow in that sort of a chamber?

A. If the pressure in the chamber were initially atmospheric pressure and carbon dioxide liquid were expanded in the chamber, snow would be formed until the pressure reached 60 pounds gauge.

Q. What would happen after that?

A. Beyond that point, because of the triple point. the snow would be converted to liquid again.

Q. If you continued—

The Court: Just one moment. Now, in order to make the record clear, as far as A is concerned if you lift up the platen, you could put cotton or wood pulp or something in there and squeeze it, couldn't you?

A. Yes, sir.

Q. But you could not put in some liquid carbon dioxide in [729] there; you would not have any way of getting it in, would you?

A. As soon as you poured it in there it would change to snow immediately while it was being poured in.

Q. In B you would have a conduit for the influent?

A. Yes, sir.

(Testimony of Earl P. Wells)

Q. That is the only difference in the two devices, isn't it?

A. Yes.

Q. By Mr. Miketta: And if I understood your answer correctly, if you continued the admission of liquid carbon dioxide into the device shown in B after some snow had been formed and the pressure runs to 60, then the continued introduction of liquid in there would not result in an expansion of that liquid into additional snow, is that correct?

A. That is correct; and the existing snow would be converted to liquid.

Q. Now calling your attention to the diagram indicated at C, can you form in the apparatus there shown a solidified liquid carbon dioxide upon the introduction of liquid carbon dioxide into that apparatus?

A. Yes; as long as the vent line is open sufficiently to keep the pressure in the chamber below 60 pounds gauge.

Q. By the Court: By "60 pounds" you mean the triple point, whether it is sixty decimal one, two, three, or four?

A. Yes, sir. That pressure varies with the atmospheric [730] pressure.

The Court: Certainly.

Q. By Mr. Miketta: Will you please describe the apparatus for the conversion of liquid carbon dioxide into snow at the plant of the Natural Carbonic Products Company during the year 1940?

A. During that year there were only the two Frick presses which were as previously described.

Q. Was there any addition or change in apparatus in 1941?

(Testimony of Earl P. Wells)

A. In 1941 the company purchased a H. P. M. press, installing it in about February, I believe, putting it into operation in about March.

Q. Of 1941? A. 1941.

Q. And by "H.P.M." you refer to what?

A. Hydraulic Press Manufacturing Company's press, I believe.

Q. Was that press still at the plant on your last visit thereto? A. Yes.

Q. Have you ever seen that press in operation?

A. I saw it first in operation in the summer of 1941 and several times since.

Q. What material was being supplied thereto?

A. Carbon dioxide liquid.

Q. And what product was being made? [731]

A. Dry ice.

Q. By dry ice you mean solidified carbon dioxide?

A. Yes.

Q. Will you please describe the general construction of the H. P. M. press?

A. The press has a chamber in which liquid CO<sub>2</sub> or snow, that is, carbon dioxide snow, can be placed or admitted, with a piston for compressing the snow, a platen for closing the chamber and for opening to remove the ice. It also has a liquid inlet, a gas outlet, and a vent pipe. It has hydraulic means for moving the pressing plunger and the platen.

Q. Where is the block outlet on this type of press?

A. The platen which opens the chamber is on the lower end of the chamber in the reverse position from the Frick press.

(Testimony of Earl P. Wells)

Q. You mentioned a vent to air or vent to atmosphere; is that connected to the return line as in the Frick presses?

A. No. This vent line is connected directly to the snowing chamber or pressing chamber.

Q. I call your attention to Plaintiffs' Exhibit 4 and ask you to examine it and point out to the court whether or not that correctly describes the H. P. M. press? [732]

\* \* \* \* \*

A. This is the pressing—

The Court: Wait a minute. There is a question. Does that, in your judgment, accurately depict the design and construction of the H. P. M. press? A. Yes.

Q. Which was there at that time?

A. Yes; in all general appearances it has the same general construction and arrangement. There is the snow chamber with its operating plunger marked "upper platen" which is moved downward by the ram operated by an hydraulic cylinder. Below we have a lower platen which is moved upward to close the chamber by means of a rod not very clearly shown, and the lower hydraulic cylinder. There is a chamber inlet marked here.

Q. By Mr. Miketta: For what purpose?

A. For the admission of liquid carbon dioxide; and a blowback outlet for the removal of gas. However, I see no indication of the vent connection on this drawing.

Q. Where would that vent connection be?

A. That is adjacent to the liquid inlet pipe and was [733] part of one of the original openings in the press as it was purchased.

Q. Will you indicate the location of that vent to which you have referred?

A. It was to the left of the chamber, the CO<sub>2</sub> inlet, at a distance, I would judge, of two or three inches.

(Testimony of Earl P. Wells)

Q. By the Court: And runs where?

A. That goes through a stop valve, and then with a short piece of pipe discharges upward to the atmosphere.

Q. Will you take your pencil and mark the outlet with a small cross and draw the line roughly where it proceeds from the outlet? Indicate what it is at the top.

A. (Witness marking on diagram) I will mark it "vent pipe and valve."

Q. Yes. And where in the pipe is the valve located?

A. The valve is located close to the press; I should say within a foot of the press.

Mr. Morris: Would it be improper at this time to have him indicate likewise where the end of that vent valve is? He has done it on that one but he has not on this one.

The Court: Yes. You might do it on that one, and then that will complete it.

A. That represents the pipe going upward.

The Court: Yes.

A. On the schematic drawing, which is part of the same drawing, there is also another indication of that vent line, [734] which would be indicated at this point.

Q. Would you do the same thing with that one?

A. (Witness marking on diagram) And there is another schematic section drawing there which likewise should have it.

Q. By Mr. Miketta: I call your attention, Mr. Wells, to the diagram at the bottom of the—

A. It is marked "flow diagram," and there is also the vent shown on that flow diagram. It should be at this point.

The Court: Mark it.



(Testimony of Earl P. Wells)

Q. By Mr. Miketta: When is the first time that you observed the air vent which you have indicated on Plaintiffs' Exhibit 4?

A. I saw it in the summer of 1941 at the time of my first visit after the press had been installed.

Q. Have you seen that press in operation?

A. I saw it as recently as April 22nd of this year.

Q. When is the first time you saw it in operation, Mr. Wells?

A. In the spring or summer of 1941.

[735]

\* \* \* \* \*

Q. By Mr. Miketta: Did you see the air vent being operated during the periods of time that you observed the press in operation?

A. Yes; the vent was in use at every time that I visited the plant.

Q. At what stage in the operation of the press is that air vent operated, Mr. Wells?

Mr. L. S. Lyon: We are talking now about Exhibit 4, your Honor? There are air vents on Exhibit 4 and 3.

The Court: Clarify it, please.

Q. By Mr. Miketta: During the operation of the machine indicated on Plaintiffs' Exhibit 4.

A. After snow has been formed in the chamber and the gas released by the ice has left to the extent that the pressure has dropped to about 5 or 10 pounds in the chamber, the vent valve is opened and the gas connection to the compressor is closed.

Q. What pressure drop is reached in the chamber?

A. This permits the pressure to drop to atmospheric pressure.

(Testimony of Earl P. Wells)

Q. Will you please describe the operation of this H. P. M. press, Mr. Wells? And in your description you may refer to the diagram or diagrams showing various stages in the operation of the press—which diagrams, your Honor, were exhibited to plaintiffs' counsel at the time of one of the conferences prior to trial, except that they were not colored [736] as they are now.

The Court: You have dolled them up a bit.

Mr. Miketta: May we have this marked for identification at the present time?

The Court: Yes; it may be so marked.

The Clerk: Defendants' I.

[Note: Defendant's Exhibit I will be found in the Book of Exhibits at page 1367.]

A. In the first diagram, No. 1, the—

Mr. L. S. Lyon: Is that for identification?

The Court: Yes; for identification.

A. —the chamber is empty and ready for the production of carbon dioxide snow, with all valves closed and the platen closing the chamber.

Mr. L. S. Lyon: May I ask if this is the diagram of the Frick presses or the operation of the H. P. M. presses?

Mr. Miketta: The question and the answer both refer to the H. P. M. press in diagrammatic form.

A. In the second diagram liquid carbon dioxide is being admitted through the valve opening, shown on the left.

Q. What is the position of the return line valve?

A. The return line valve is open to the compressor so as to release gas that is formed during the expansion process. The vent valve is closed.

(Testimony of Earl P. Wells)

Q. And by the "vent valve" you are referring to the valve, the line and valve immediately beneath the return line and valve? A. That is correct. [737]

Q. And by that vent to air you also refer to the vent which you have indicated in red on Plaintiffs' Exhibit 4, is that correct? A. Yes.

Q. Very well.

A. The diagram is marked "snow formation." However, that is contingent upon the pressure in the press. If the pressure is above 75.1 pounds absolute, there is no snow formation.

Q. Up to the time that the pressure is below 75.1 absolute does any snow formation take place?

A. Yes. From below this triple point the snow is formed, the gas is—

Q. Pardon me, Mr. Wells. Does 75.— A. 1.

Q. —1 refer to or is it equivalent to 60 pounds pressure, approximately? A. Yes.

Q. 60 pounds gauge?

A. 60 pounds gauge is an approximate value, depending upon atmospheric pressure. 75.1 is the accepted accurate figure. In diagram 3 the inlet valve is shown closed, while the gas return line to the compressor is still open and the pressure in the press is falling. [738]

\* \* \* \* \*

Q. Have you observed the pressures existing in the chamber of this H. P. M. press, Mr. Wells?

A. Yes; I have.

Q. Will you state what the maximum pressure reaches?

A. The highest pressure that I have ever witnessed in this chamber is 75 pounds.

(Testimony of Earl P. Wells)

Q. Is that maximum pressure reached in the chamber during all of the operations that you have witnessed on the H. P. M. press?

A. It occurs only during the liquid inlet period.

Q. Have you observed any operations of the H. P. M. press where the pressure did not go above 60 pounds?

A. Yes. I conducted some experiments myself at pressures below 60 pounds gauge.

Q. And they were conducted on the H. P. M. press in the plant of this defendant?

A. Yes; and also on the Frick presses.

Q. Do you know whether or not commercially, as a part of the regular operation, the H. P. M. press was operated with gas pressures within the chamber not in excess of 60 pounds?

A. I am not familiar with the amount of time which the press might have operated at various press pressures, [739]

\* \* \* \* \*

A. During one visit, which I believe was in 1943, I saw the plant being operated at a pressure below 60 pounds.

Q. So that the maximum pressure within the chamber of the H. P. M. press at that time did not exceed 60 pounds? A. That is correct.

Q. And you have personally observed the pressing operation when the maximum pressure within the chamber of the H. P. M. press was above 60 pounds?

A. Yes.

Q. If we assume that the maximum pressure within the chamber of the H. P. M. press does not exceed 60

(Testimony of Earl P. Wells)

pounds what takes place in Fig. 3 of Defendants' Exhibit I?

A. In Fig. 3 the snow formation has been completed and only the remaining gas is being removed, with the exception that some gas is liberated during the further cooling of the snow from the triple point to atmospheric pressure; so gas [740] continues to leave the chamber and the pressure continues to drop.

Q. Assuming that the maximum pressure within the chamber of this H. P. M. press had been above 60 pounds—and I think you referred to 75 pounds at one time—then what would be taking place in Fig. 3 of Defendants' Exhibit I?

Mr. L. S. Lyon: If your Honor please, may we have it clear whether these figures are gauge pressures or pressures within the chamber?

The Court: Yes. Indicate in your question which you refer to.

Mr. Miketta: Let me lay a little foundation for that, your Honor.

Q. At the plant of Natural Carbonic Products Company is there a pressure gauge connected to the chamber of the press?

A. Yes.

Q. And is it calibrated in absolute pounds or gauge?

A. Gauge.

Q. So that when you refer to pressures ordinarily you refer to gauge pressures?

A. Yes.

Q. And not to absolute?

A. Yes; gauge unless otherwise specified.

Mr. Miketta: Does that clarify the point, your Honor?

The Court: Yes.



(Testimony of Earl P. Wells)

Q. By Mr. Miketta: Assuming that the pressure as indicated [741] by the gauge, the maximum pressure, was 75 pounds, so that a maximum pressure of 75 pounds existed in the chamber of the H. P. M. press, that maximum pressure would have taken place before the inlet valve was closed, is that correct? A. Yes.

Q. What operation would then be taking place in Fig. 3 which shows the inlet valve closed?

A. The body of liquid which would be in the chamber would be boiling and subliming and converting to snow or ice with the evolution of gas.

Q. And at what pressure does such evolution or boiling take place?

A. At 60.4 pounds gauge under standard sea level conditions.

Q. Before we leave Figs. 2 and 3, Mr. Wells, have you ever observed the seal or so-called contact plane between the lower platen and the bottom of the H. P. M. press? A. Yes.

Q. Is that a tight closure?

A. It is a mortise and tenon type metallic joint which is substantially tight when it is clean and new. [742]

\* \* \* \* \*

Q. By Mr. Miketta: At the times that you actually saw the pressing operation was that closure gas-tight?

A. Practically every time that I observed the press there has been leakage around this joint due to deposit of water ice there from the atmosphere and due to damage to the metallic surface by operation of the press. There is generally a leakage around the gasket during operations.

(Testimony of Earl P. Wells)

Q. Now continue with the description of the process as it takes place in the H.P.M. press, Mr. Wells. What is the next step after the operation shown in Fig. 3?

A. In Fig. 4 the return valve is closed, indicating that the pressure has dropped to probably 5 or 10 pounds; the liquid inlet valve is closed and the vent valve to the air is opened to release any remaining gas. The lower platen has been dropped to also release any gas that may be under the block or under the pile of snow.

Q. Does any considerable volume of gas escape when that platen is lowered?

A. Yes; there is a large visible rush of gas out of there.

Q. Just to give us a picture of this press, Mr. Wells, what are the dimensions of the chamber of the H.P.M. press, that is, the inside dimensions?

A. Cross-sectional dimensions horizontally are 20 inches by 20 inches.

Q. How high is the boss on that lower platen, if you [743] know?

A. It is approximately two inches.

Q. How far is that lower platen dropped when it is moved in to the position indicated in Fig. 4?

A. It is dropped so that the top of the platen is slightly above the bottom of the chamber, so that snow will not fall out.

Q. Do you know the width or the size of that boss on that lower platen?

A. In horizontal dimensions?

Q. Yes.

A. There is a gap of approximately an eighth of an inch between that boss and the chamber.

(Testimony of Earl P. Wells)

Q. So that there is an eighth of an inch space all around that boss and the inside walls of the chamber, is that correct? A. Yes.

Q. By the Court: The diameter of that chamber, you said, was what?

A. It is square, your Honor; 20 inches by 20 inches.

The Court: Oh, it is square and not cylindrical?

A. Yes.

Q. 20 x 20? A. Yes.

Q. And the height?

A. I am not familiar with the exact height, but I would [744] judge it to be about four feet.

Mr. Miketta: And the boss on that lower platen, your Honor, I was trying to get the dimension of that.

Q. What is that, Mr. Wells?

A. Approximately — well, it would be approximately 19 and 3/4 inches by 19 and 3/4 inches.

Q. So as to leave a space of about an eighth of an inch between that boss and the walls of the chamber, is that correct? A. Yes. [745]

\* \* \* \* \*

Q. By Mr. Miketta: Will you again refer, please, to Defendants' Exhibit I. I believe you have been testifying about Fig. 4 of this exhibit, and, as I recall your testimony at that stage, the vent to atmosphere, or vent to air, is opened, and the lower platen is dropped, is that correct? A. That is correct.

Q. What is the position of the pressing plunger at that time?

A. The lower plunger is down about one inch and a half.

(Testimony of Earl P. Wells)

Q. The lower platen?

A. The lower platen, yes.

Q. What is the position of the pressing plunger within the chamber?

A. The pressing plunger is at the top of the chamber.

Q. What is the next step in the operation of this apparatus?

A. The next step is shown in Fig. 5, where the snow is being compressed by the plunger moving downward, while the lower platen is still in the slightly opened position.

Q. What is the position of the vent to atmosphere?

A. The vent to air is opened, as in the previous diagram.

Q. Is the solidified carbon dioxide completely compressed into a block, in Fig. 5? [753]

A. There is a little further pressing action performed by the lower platen moving upward after the plunger has reached its practically bottom position of maximum compression.

Q. Where is that illustrated on Defendants' Exhibit I?

A. Fig. 6 shows the lower platen moved up to almost closed position.

Q. Is there any further downward move of the pressing plunger from the position shown in Fig. 5, and that shown in Fig. 6?

A. Yes, there is a small further movement as the snow is compressed, and as the gas is released.

Q. During the operation shown in Fig. 5 is the vent to air open?     A. Yes.

(Testimony of Earl P. Wells)

Q. Will you continue with your description of the process, please?

A. In Fig. 7 the plunger is being raised, and the lower platen is dropped to a still further open position, in which the top of the boss is just slightly below the bottom of the chamber. The vent to air is still open, the block of ice remaining suspended in the chamber due to the friction between the block and the chamber walls.

This situation continues into Fig. 8, at which time the pressing plunger has reached its uppermost position, when the vent to the air is closed. By this time the block has [754] usually freed itself from the sidewalls and drops by gravity onto the lower platen, which is then lowered to reveal the block and enable its removal. Dropping the block is assisted to some extent by gas above the block, or by the injection of hot gas to create a pressure there to force the block to drop.

Q. Are we to understand that sometimes gas is injected in the space or chamber above the block?

A. That is, high pressure gas off of the compressor discharge.

Q. For the purpose of pushing the block out of the chamber?

A. Pushing the block down. The same effect can be obtained by slightly opening the liquid valve, and permitting a small amount of liquid to gasify.

Q. Mr. Wells, during the period that the chamber is being supplied with liquid carbon dioxide is that chamber without any communication with the outside?

Mr. L. S. Lyon: I object to that as indefinite. What do you mean by outside?

The Court: Objection sustained.



(Testimony of Earl P. Wells)

Mr. Miketta: I will rephrase that.

Q. During the period of time that the chamber is being supplied with liquid carbon dioxide, is that chamber isolated?

Mr. L. S. Lyon: Same objection.

Q. By Mr. Miketta: Do you understand the question, Mr. [755] Wells?

Mr. L. S. Lyon: I objected to the question, your Honor.

The Court: During the time that the liquid CO<sub>2</sub> is flowing into the chamber through the inlet is the chamber, other than the inlet, hermetically sealed?

A. No, the return line is open for the withdrawal of gas.

Q. By Mr. Miketta: During the period of time that solidification of the liquid carbon dioxide is taking place within the chamber, is that chamber closed or sealed?

A. No.

Q. Why not?                      A. Because—

Mr. Morris: I object, your Honor, to this question, that it is closed or sealed. We are using terms in that question that are used maybe in one sense, but might not be used in the sense that they are used in the patent or in the claims thereof.

The Court: Objection sustained. Reframe your question, please. I particularly used the words "hermetically sealed" to avoid the word "closed."

Q. By Mr. Miketta: During the period of time, Mr. Wells, that solidification is taking place within the chamber, is there any passage of gas into or out of that chamber?                      A. Yes.

(Testimony of Earl P. Wells)

Mr. Morris: May I object to that, because this witness has been taken through the drawings which show the state of [756] the valves, whether they are open or closed, that is, both the inlet and the outlet, so the question that is now propounded to the witness would be, we submit, a conclusion.

The Court: Objection overruled. He is an expert.

A. Gas is leaving the chamber through the return pipe to the compressor, and some additional gas is escaping around the bottom platen due, perhaps, to the imperfection, of dirt and foreign material, preventing a perfect seal.

Q. By Mr. Miketta: What is the pressure within the chamber prior to the pressing of the solidified carbon dioxide into a block, immediately prior to the step of pressing the carbon dioxide into the block?

Mr. L. S. Lyon: I object to that. No time is fixed; no occasion mentioned. The question is too indefinite.

Mr. Miketta: Limiting it to your observation of the machine, Mr. Wells.

Mr. L. S. Lyon: Unless the witness will state that the pressure at that stage of the operation was always the same when he observed the machine, I think he should state specifically what the pressures were on the different occasions he saw the machine.

Mr. Miketta: I will ask the witness that, Mr. Lyon.

Q. At the various times that you observed the operation of the H. P. M. press, Mr. Wells, was the pressure within the chamber, immediately prior, or at the time that the pressing plunger first started to move down, substantially the same? [757]

A. Yes, it was always at atmosphere pressure, because of the opening to the air.

(Testimony of Earl P. Wells)

Q. By the Court: Actual atmosphere or substantially atmosphere?

A. Substantially. That is, gas had ceased to flow in any quantity out of the vent, so that there was practically equilibrium established between the chamber and atmosphere.

Q. By Mr. Miketta: When you say equilibrium established between the chamber and the atmosphere, the only difference then would be what?

A. Slight friction in the pipe due to a very small amount of gas moving outward, perhaps.

Q. As you have observed the operation of the machine, was the lower platen in its completely closed position, prior to the completion of the pressing stroke of the plunger?

A. No, it was dropped approximately one inch and a half.

Q. You have described the operation of the H. P. M. press. What is the relationship between the operation which you have described and the operation of the Frick press?

A. They are substantially the same, except that the two machines are built in reverse, or located in a reverse position: the bottom of one being functionally the top of the other, with the further exception that the block does not drop upward, of course. It has to be pushed up by the plunger in order to remove it from the press.

Q. In the Frick press, therefore, the block is actually [758] ejected by the pressing plunger?             A. Yes.

Q. That isn't true in the H. P. M. press?

A. Yes. it is not true.

(Testimony of Earl P. Wells)

The Court: In other words, it isn't pulled up by the hydraulic appliance, but is pressed up by the lower platen operated by the hydraulic pressure under the product?

A. In the Frick press the pressing plunger also forces the block upward out of the press.

The Court: Otherwise they are mechanically the same?

A. Mechanically the same. The function is the same.

Q. By Mr. Miketta: Would it be correct, Mr. Wells, to say that the operation of the Frick press can be diagrammed or illustrated by simply turning Exhibit I upside down?

A. Yes, with the exception of the block dropping.  
[759]

Q. Of course, the block would be pushed up now by the plunger, instead of being lifted up? A. Yes.

The Court: Is this being introduced in evidence?

Mr. Miketta: Not yet. It is marked for identification as Defendants' Exhibit I.

[Note: Defendants' Exhibit I will be found in the Book of Exhibits at page 1367.]

The Court: It may be received in evidence as Defendants' Exhibit I purely for the purpose of illustrating the testimony given by this witness.

Q. By Mr. Miketta: While you were at the plant of the Natural Carbonic Products Company did you at any time take any pressure readings, on the Frick and H. P. M. presses? A. Yes, several times.

Q. Have you kept a record, or have you made a diagram showing those pressures? A. Yes, I have.

(Testimony of Earl P. Wells)

Q. Can you produce it? Your Honor, this is the chart that was exhibited to counsel this morning. I would like to have it introduced, as the other exhibit was introduced this morning, and marked for identification, subject to counsel's study of it, and giving him an opportunity to cross-examine the witness on this.

The Court: It may be marked for identification as the defendants' next in order.

Mr. L. S. Lyon: I would like to inquire, your Honor, if this chart was in existence on the occasion of our pre-[760] trial conference. If not, when it was produced.

Mr. Miketta: I will ask the witness some questions from which you can derive that information.

Mr. L. S. Lyon: I would like to object to the use of this chart, if it is based on records, and unless we have a chance to examine the records on which it was based.

The Court: Of course, it is just marked for identification so far.

The Clerk: Defendants' J.

[Note: Defendants' Exhibit J will be found in the Book of Exhibits at page 1368.]

The Court: Would you like to examine the witness on voir dire?

Mr. L. S. Lyon: I would, if the chart is to be used.

Q. By Mr. Lyon: When was this chart made, Mr. Wells? A. Approximately April 30th, this year.

Q. When did you first show it to Mr. Miketta?

A. On that same date.

Q. This is a chart of certain pressure readings, is it not? A. Yes.

Q. Did you make this chart? A. Yes.



(Testimony of Earl P. Wells)

Q. From memory of those pressure readings?

A. No, from a record of readings which I took at the plant.

Q. Where are those records? A. In my office.  
[761]

Mr. L. S. Lyon: I think, your Honor, we would like to have the records here then. This is not the best evidence.

Q. By Mr. Miketta: Mr. Wells, are they in the form of formal records, or just memoranda?

A. Just memoranda incorporated in connection with other work, scattered throughout other documents.

Mr. Miketta: If the court please, I will ask Mr. Wells to obtain them, and have them available for counsel's inspection. I have not seen them myself. Engineering figures of this sort are ordinarily just kept in memoranda form, and transcribed into the form of graphs.

The Court: Bring them Tuesday morning.

Mr. L. S. Lyon: May I ask, Mr. Wells, if your records show the date in July, 1939, of those pressure readings that are represented by valve No. 1 on this chart?

A. I believe they do, yes.

Q. Did you make a record of what you saw there at that time, on your visit, as to what readings or values you recorded. A. Yes.

Q. That is the record you have in your office.

A. Yes.

Q. Will you bring in the complete record, please? Is your answer the same for these other readings that are charted on this exhibit, that you have similar records?

[762] A. Yes.

Q. I would like to have your complete records of those visits. Have you records, similar records of other visits to

(Testimony of Earl P. Wells)

this plant, during the years 1940, 1941, 1942, 1943 and 1944, which are not charted on this exhibit?

A. I don't know. I didn't look through all my records to see what further records I had.

Q. You may have other records?

Mr. Miketta: I will assure you, Mr. Lyon, if we find any additional ones we will produce them. [763]

\*   \*   \*   \*   \*   \*   \*   \*   \*   \*

Q. In your judgment, Mr. Wells, what is the purpose or object of the step of venting the chamber to atmosphere and lowering the lower platen during the operation of the H. P. M. press. [765]

A. There are several reasons for it. One is safety precaution. In the event that the gauge line is plugged and not reading accurately, or if the snow line is plugged, there could exist in the chamber dangerous pressure which would cause an explosion when the lower platen is dropped.

Q. Explosion of what?

A. Explosion of the ice and snow, or a block or a sudden release of gas which might injure the operator by—

The Court: Now, just a minute. It is not the snow or ice that explodes?

A. Well, there is to this extent, your Honor, that inside the block as it is being formed there are sometimes pockets of gas which—

Q. Then, it is gas which explodes, isn't it?

A. Yes; gas in the block which causes fragments of the block to fly off if the lower platen is removed while there is still pressure in the press.

(Testimony of Earl P. Wells)

The Court: Yes.

A. And there is another advantage, that speed of production can be increased by not waiting for the compressor to remove the last five or ten pounds of gas in the chamber. That about covers it, I think.

Q. By Mr. Miketta: Does Exhibit I correctly illustrate the operation of the H. P. M. press as you observed it?

A. Yes.

Q. And it also correctly illustrates the operation of [766] the Frick press as you observed it, with the inversion of the diagrams and the exception as far as ejection of the block is concerned?

A. Yes.

Q. To which you have referred?

A. Yes.

Mr. Miketta: That will be all.

The Court: Just one question.

Q. You said, without waiting for pressure to take out the last few pounds of gas. What is the pressure maintained ordinarily on the outlet conduit leading to the compressor?

A. At the Natural Carbonic plant the compressor can continue to pump on its suction line until a vacuum is produced. That vacuum will be produced if the valve in the return line is closed, and so the pressure in the press can be stopped at any point down to a vacuum of maybe 20 inches.

The Court: I see.

Mr. Miketta: In other words—may I ask another question?

The Court: Yes, yes.

Q. By Mr. Miketta: In other words, if the valve in the return line was left in its open position and no additional liquid carbon dioxide were introduced into the press,

(Testimony of Earl P. Wells)

that entire chamber could reach a sub-atmospheric pressure, is that correct?

A. It would tend to, but air would enter at the bottom of the block and tend to prevent a vacuum. [767]

Q. Because of the imperfect manner in which the lower platen seals the bottom of the chamber?

A. Yes; and because it is in a lowered position.

The Court: Well, you mean because of the manner in which the lower platen does not seal the chamber, don't you?

Mr. Miketta: Yes; or the imperfect manner in which it does seal.

The Court: Yes.

Mr. Miketta: Your statement was more correct, your Honor.

Q. And you open the vent to atmosphere because the reduction in pressure to a zero gauge within the chamber is more rapidly accomplished in that manner than in permitting the compressor to reduce that pressure through the return line, is that correct?     A. Yes.

Mr. L. S. Lyon: I object to that as leading, your Honor, and suggestive. The witness has already in his own words stated why the operation is performed.

Mr. Miketta: I was trying to summarize his testimony, your Honor.

The Court: Well, it is rather a summary. Objection overruled. You may answer.     A. Yes.

Mr. Miketta: That will be all. [768]

\*     \*     \*     \*     \*     \*     \*     \*     \*

(Testimony of Earl P. Wells)

Cross-Examination.

Q. By Mr. L. S. Lyon: Mr. Wells, what was your position with the Gay Engineering Company on the 1st of January, 1940? A. I was a sales engineer.

The Court: Excuse me one minute. You had no additional questions?

Mr. Foster: No, thank you, your Honor.

The Court: I wanted the record to be clear.

Q. By Mr. L. S. Lyon: What instructions did you receive from your superior with reference to what your duties were to be and what your responsibilities were to be in connection with this revamping of the plant of the Natural Carbonic Company at Niland?

A. My duties were to increase the capacity of the existing plant by increasing its efficiency with alterations to the equipment.

Q. When were those duties first assigned to you? [769]

A. Oh, they were not exactly assigned to me. It was a sales effort of my own, but the negotiations for the contract were begun in about January, 1940.

Q. And how long did you have the matter in process before any actual physical changes were undertaken at the plant at Niland? A. About two months.

Q. During that time did you call on Dr. Charles Jones who is here in the courtroom and who has been a witness on the stand here? A. No.

Mr. Foster: Objected to as immaterial.

Q. By Mr. L. S. Lyon: Did you call on Dr. Charles Jones in 1940? A. In the fall of 1940, I believe. [770]



(Testimony of Earl P. Wells)

Q. By Mr. L. S. Lyon: What was the purpose of you calling on Dr. Jones on that occasion? [771]

\*   \*   \*   \*   \*   \*   \*   \*   \*

A. I had two reasons for calling on Dr. Jones, who was then in the research department of the Continental Can Company, engaged in work in connection with dry ice. One of them was to hear his background upon the matter of these patents held by International Carbonic, because about September of 1940 I first learned that these patents were in existence and it seemed strange to me that none of the—or, most of the dry ice companies operating in the west were not paying royalty to the International Carbonic Company and were not notified of infringement. I had a client who was contemplating investing in another dry ice plant, and he asked me to go east to investigate the patent situation. And I had a second reason for wanting to get some information about crystalin growth in dry ice.

Q. By Mr. L. S. Lyon: And following your meeting with Dr. Jones did you go on to New York and call on Mr. Harry Cole who is here in the courtroom?

A. Yes. [773]

\*   \*   \*   \*   \*   \*   \*   \*   \*

Q. By Mr. L. S. Lyon: What was your purpose in so calling on Mr. Cole?

\*   \*   \*   \*   \*   \*   \*   \*   \*

A. It was the same reason, to find out the position of International Carbonic in the patent field and to determine for myself how important the patents were as affecting future plants which we might build.

(Testimony of Earl P. Wells)

Q. At that time had you read the patent involved in this suit?

\* \* \* \* \*

A. I had read the Cole and McLaren patent only for the first time in about October, 1940.

Q. Can you fix the approximate time of your meeting with [774] Mr. Cole?

\* \* \* \* \*

A. Approximately October, 1940.

Q. Did Mr. Cole furnish you with a copy of the form of license being offered by International Carbonic, plaintiff in this case, at that time?

\* \* \* \* \*

A. Yes. [775]

\* \* \* \* \*

Q. By Mr. L. S. Lyon: Can you tell us when you started the revamping of the plant of the Natural Carbonic Company at Niland?

A. Approximately April 15, 1940.

Q. 1940? A. 1940; yes, sir.

Q. How long did your work in revamping that plant continue, over what period of time?

A. The new plant was put into operation on May 9th, but additional work continued for another month or two.

Q. You say the new plant; will you tell us what the difference was in the new plant as compared with the plant before you undertook your work on it?

A. We installed, or my company installed additional compressors to practically double the output of the plant, in addition to revamping the original plant.

(Testimony of Earl P. Wells)

Q. And at that time, the plant as revamped by you and put in operation, included a compressor system and two of these Frick apparatus, is that right?

A. Yes. The two Frick presses were in existence when we started to work.

Q. By The Court: You mean they were on the job?

A. Had been in use for many years.

Q. By Mr. L. S. Lyon: You have referred to this Exhibit I, [776] the colored diagram. Did you prepare this exhibit yourself?     A. No; I did not.

Q. Are these legends on this exhibit yours, or were they put on the exhibit by somebody else?

A. By whoever made the rest of the diagram.

Q. When did you first see this exhibit?

A. In its present form, today. However, I saw early sketches of these figures, separately, about ten days ago.

Q. Did you prepare those original sketches?

A. No; I did not.

Q. Do you know who did?     A. No.

Q. Did you furnish the information for them?

A. No; I did not.

Q. Referring to Fig. 2 on this Exhibit I, what is meant by the word "snow" in the legend reading "snow formation with gas released"?

A. Well, I think that means that as the gas is released the snow is formed simultaneously.

Q. By that, do you mean—

The Court: Let us see. I think that the question was improper in form. I think what you should ask him is this: In his answers to his questions what did he understand the meaning of those words to be, rather than what the meaning actually was, which, of course, he manifestly